Technical Scrapbook, Cat. 1152

This scrapbook covers the period May-November 1887. The entries are by Edison. Included are notes and drawings relating to phonographs, ore separators, lamps, electric power distribution and regulation, and the production of wrought iron. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The name of Mina Edison appears as a witness on some of the documents. The case number of Edison's patent application has been written on some of the items.

119 May 14 1889 Patent Tag a new process

The object of this invention is to make wrought iron direct from Molten Cast iron.

The invention consists in running the molten metal into pigs in the sand mould or other receptacle and the ends of which are two iron rods connected to a powerful dynamo Electric machine of sufficient ampere capacity to cause the iron to remain liquid & to boil & remain liquid for such a time as the carbon is nearly burnt or all burnt out, ~~so that much of the carbon is gradually removed the carbon is burned with the iron rods~~ ~~The rods are~~ The current is taken off the rods pulled & the liquid allowed to cool. The ends of the bar are slightly larger than the bar itself to prevent the carbon rods from

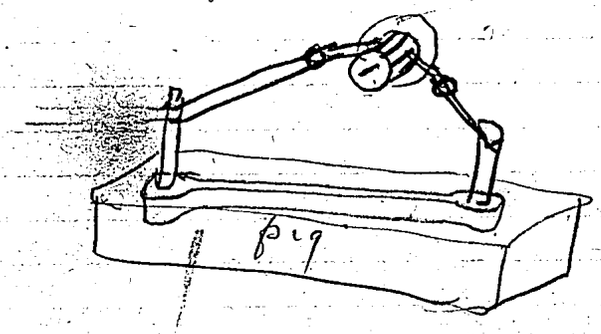
melting, to improve the grain & quality I cause the mass to be placed in a powerful magnetic field so that when it is cooling the particles of iron shall be given a directive force, and thus give a grain & toughness to the iron. I am aware that Electric currents have been passed through molten iron and I am also aware that molten iron has been allowed to cool in a magnetic field, but I claim as new the use of a sufficiently powerful current to maintain such iron in a molten state for an indefinite time, and also the use of a sufficiently powerful magnetic field as to cause a directive force to be given the particles of iron when nearly set. No effect will be produced with the small magnetic methods used

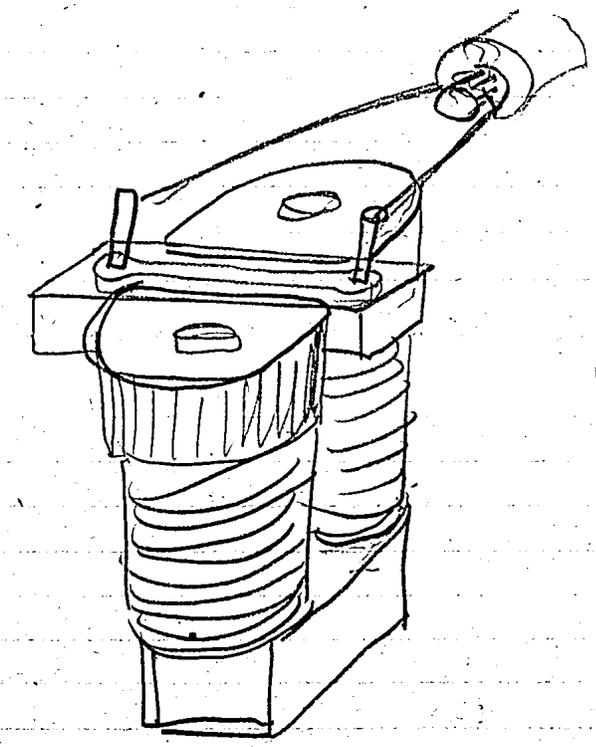
as iron at the moment of hardening from a Mallein state has very little magnetic capacity hence the Exceedingly powerful ~~[illegible]~~ magnets of the large Modern Dynamo machines will alone produce any effect,

Claim, the passing of current to keep in liquid state,

Claim powerful feed slot.

Claim both in Combination





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SCHENECTADY, N. Y., _____

Dyer -

Patent -

Improvement in phonographs

The object of the invention is to improve the articulation of the phonograph -

The invention consists of a cylinder of wax ~~coated~~ or other yielding material such as moulded Kalomi, Camphor Napthalin coated with tin foil or films of gelatin or other smooth extensible materials, so that the surface could be very yielding yet none of the material of the cylinder should be cut away -

The invention further consists in causing the reproducing point communicate directly to the diaphragm to be given motion not by ~~reducing in & out of the indentations~~ but by ~~by~~ stretching ~~the~~ ~~alternation~~ Gelatinous

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SCHENECTADY, N. Y.,

2

The point and the electrified cylinder or point as the case may be, the point does not come in contact with the moving surface but nevertheless ~~the~~ it will ~~to~~ be given a motion corresponding to pitch & amplitude of the indentations.

The Electrification of the point or tin foil surface is accomplished by a small disk of hard rubber or glass provided with a rubber & collector - ~~or~~ The disk being turned simultaneously with the phonographic cylinder. ~~instead~~ ~~instead~~. ~~The House Mill electrifier of Varley~~ ~~Wooldridge~~ ~~instead with Commutator~~ Any other Electrifying device may be used ~~motion~~

The cylinder of wax or other material is connected to the earth in the usual method in static electric apparatus.

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The smooth surface of the cylinder is grooved by a grooving tool like a Chaser. This is in advance of the recording point ~~on the cylinder~~. The recording point is of chisel shape & indents the apex of the ridge left by the Threading tool. Thus the record extends outward beyond the general surface of the cylinder & is very susceptible to attraction for the point on the receiving diaphragm.

Claim: reproducing from ~~at will speech~~ & ~~other records from wax records~~ phonographic records by electrification of the ~~cylinder~~ record or reproducer or both.

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2nd Reproducing without contact,

3 The Chisel point -

4 — Wax ~~cyl~~ Cylinder of or other yielding material
coated with an Extensible material

5 forming a thread or screw ~~layer~~
& recording on the apex of the
ridge between

~~6~~ 6 — ~~yielding~~ Cylinder of yielding material, covered with
metallic ~~t~~ foil.

Etc — T A E May 21
1887

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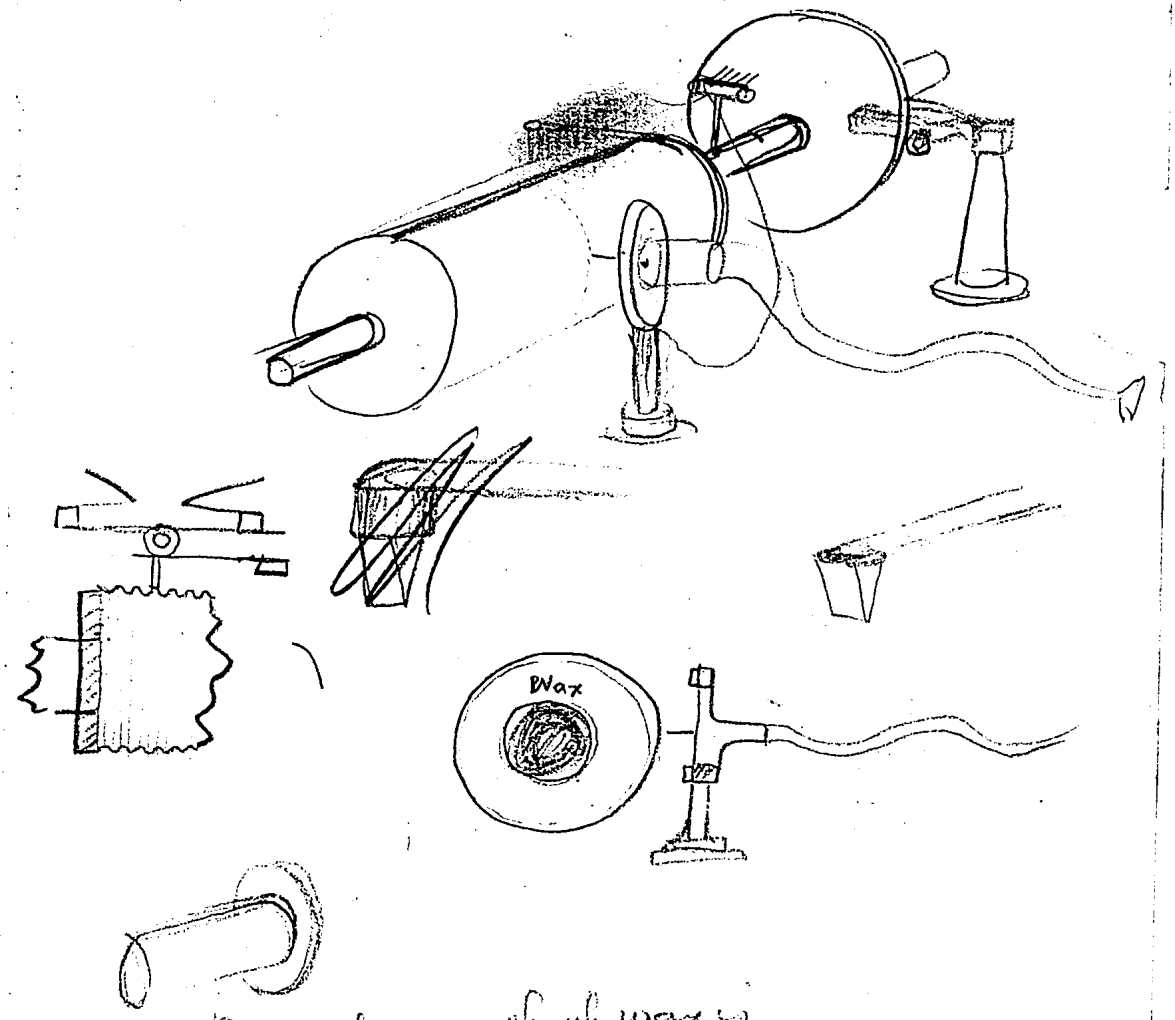

Brass sleeve on which wax is
cast ~~[illegible]~~ or moulded as a cylinder.

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725

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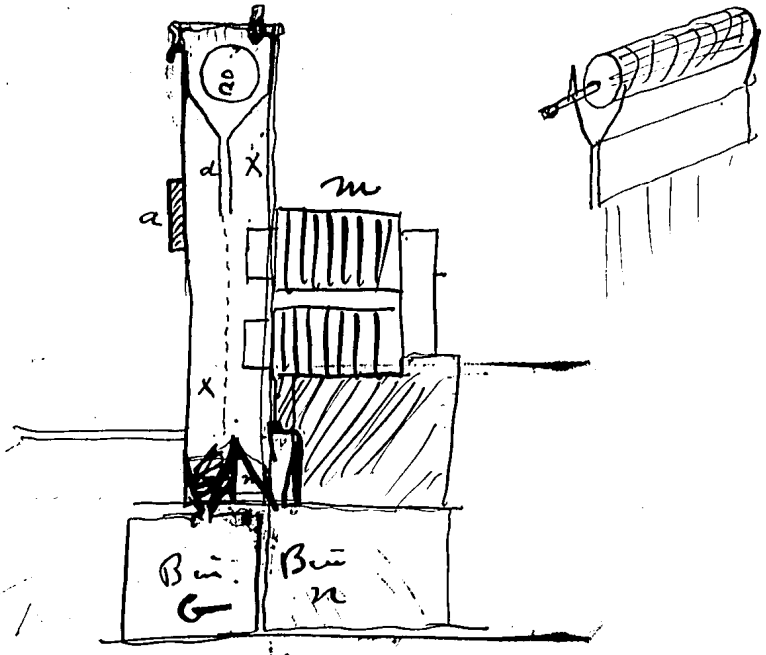
Dick –

Patent, Apparatus for ~~stuffing ore~~ – separating ores



X X is a closed chamber to prevent draughts of air from disturbing the perpendicular fall of the fine particles. This chamber which is made of wood is in certain instances where the ore has to be ground very fine to liberate the gold

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NEW YORK, _____ 188

2

is provided with gockets & stuffing boxes. and the chamber connected to an ordinary steam Vacuum apparatus the air being continuously Exhausted to 29 inch column of mercury. the residual air being thus rarified does not appreciably affect the perpendicular fall of the particles unaffected by the magnet, a ~~Division~~ Bin G receives the gold & non magnetic material & Bin H the magnetic material –

d is a straight fall box C is a revolving cylinder Sieve, the fine particles from which fall into d and in passing downward are given a straight Course before leaving the mouth of d — as this has to be or is better to be placed near the pole of the magnet the magnetic particles in the ore are drawn to one side of d & clogg it, but a bar of iron a is placed on the other side of such a mass & in such

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a position that a counter attraction ~~of~~ or balance is obtained & clogging is prevented.

Claim — Closed chamber

2nd Closed chamber exhausted

3rd altering trapping in closed space

4 " " " Vacuum space

5 — straightening fall box d

6 — gran bar a

7 Rotating sieve in closed chamber &c

Etc —

June 24 1887

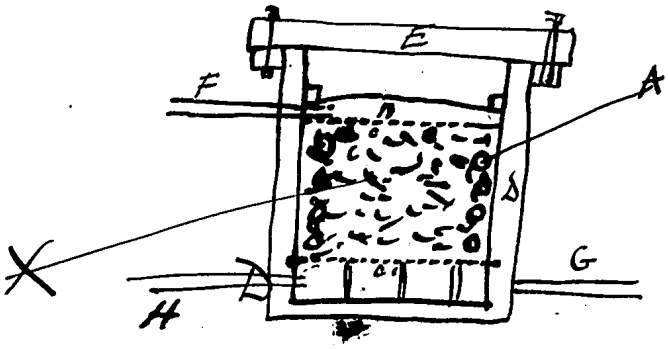
July 1 1887

Dyer-

Patent following -

The object of this invention is to provide an economical and satisfactory process for seperating fibres from the stalk & surrounding matter in fibrous plants.

The process consists in packing the stalks stems etc after barking or splitting as the case may be in tanks containing a coil of steam pipe. Then allowing a hydrocarbon to percolate upwards through the mass until the whole is covered with the liquid, The tank being closed. water is passed through the coiled pipes at various temperatures according to the material to be operated upon; for plants containing fibres surrounded by pulpy material like the agaves, The temperature should be about 130 faler but for flax a temperature of 175 is best. but many very pulpy plants



D is the tank holding a ton or more of material
C' & C are plates perforated C' acting as
false bottom, on this rests the material X
on top of this is another perforated plate
secured to a frame B & by which is mass
of material is pressed down to occupy
a smaller space; an inlet pipe G. serves
to force the hydrocarbon upwards through
the material. when the action is finished
G is shut off & water is forced

through H. displacing the Hydrocarbon upwards & from the material, the Hydrocarbon is drawn off through F & run back into the tank connected to G. to be used over again, Time must be given the water to displace the oil so that a very small fraction will be ~~wasted~~ wasted | if care is taken with respect the oil will perform an almost infinite amount of disintegration thus cheapening the process —

Claim process of separated fibres from the plant by steeping in a material insoluble in water —

2nd use of a hydrocarbon —

3 Heat,

4 — displacement,

5 — the apparatus —

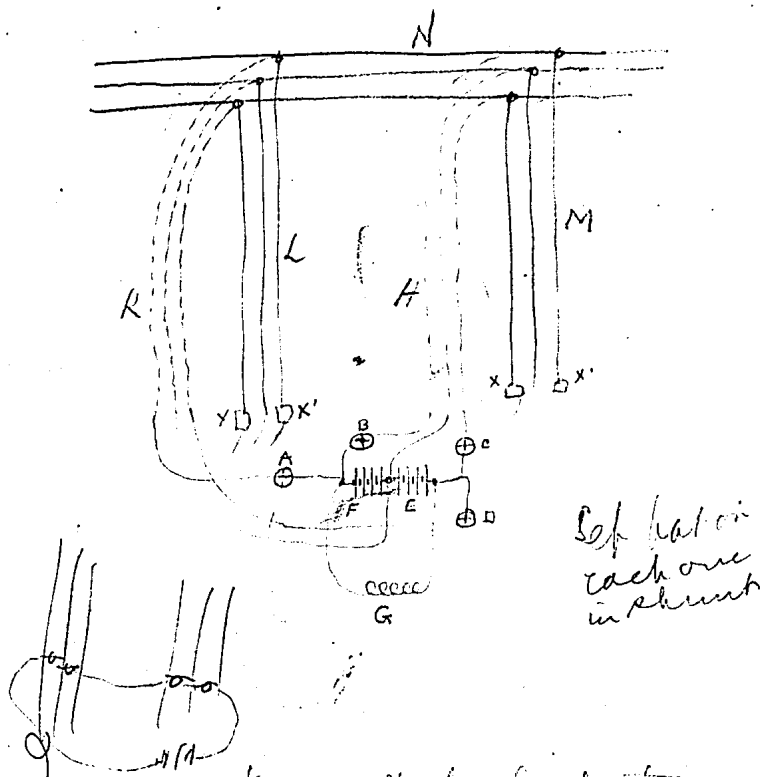
— July 1887 —

ordinary temperature will answer: after 1 to 3 weeks the action of the hydrocarbon liquid is such that it displaces the water from the material surrounding the fibres, & destroys all the adhesive properties so that when the material is taken from the tank, running water will carry off all the pulpy matter and leave the fibres perfectly clean. They will not be injured in the slightest by this operation, whereas by rotting, hackling & use of acids & alkalis as is now the case the fibre is very much broken and weakened — Almost any liquid of the nature of a hydrocarbon, which is insoluble in water will answer for this reaction, but I prefer to use, petroleum oil being cheaper & as good as any. Oxygenated Hydrocarbons insoluble in water Bisulphide Carbon ~~Ether~~ & many other can be used —

Rogers –

Patent

(1) Sept 5/09



Improvements in methods of indicating Electric pressure in Central Electric Light Stations –

2

The invention consists in the employment of a standard battery giving the same electromotive force as that required at the ends of the feeders combined with several sets of pressure or return wires multiple wired across such battery through galvanometers A B C D. The battery is so connected that it gives a contrary pressure in circuit to that due to the dynamos so that when the pressure at the pressure wires is 100 volts positive the standard battery will give 100 volts N & never no. Current will pass through the galvanos A B C D & they will stand at zero indicating that the pressure at the end of the feeders K M is correct, but if the load on the mains N decreases or one of the feeders

one of in the other - and reads to say 101 Volts; then there will be a current due to a potential difference of one volt & this will deflect the indicator it may then be brought back to zero by means of the feeder regulator X X' a Resistance G is placed around the battery to keep it in good action by this method the accuracy of the results do not depend on the indicating apparatus which need not be delicate and a deflection of several inches may be had due to a difference of one volt. The maximum difference that is possibly obtainable in current is obtained by this method, hence friction & other defects which render ordinary indicating apparatus so liable to incorrect reading.

owing principally to the ~~[illegible]~~ necessity of great delicacy is obviated - As all indicating apparatus is originally calibrated by the Battery it follows that a properly constructed Battery is the best possible device for securing constant pressures in a Station over a long period of time -

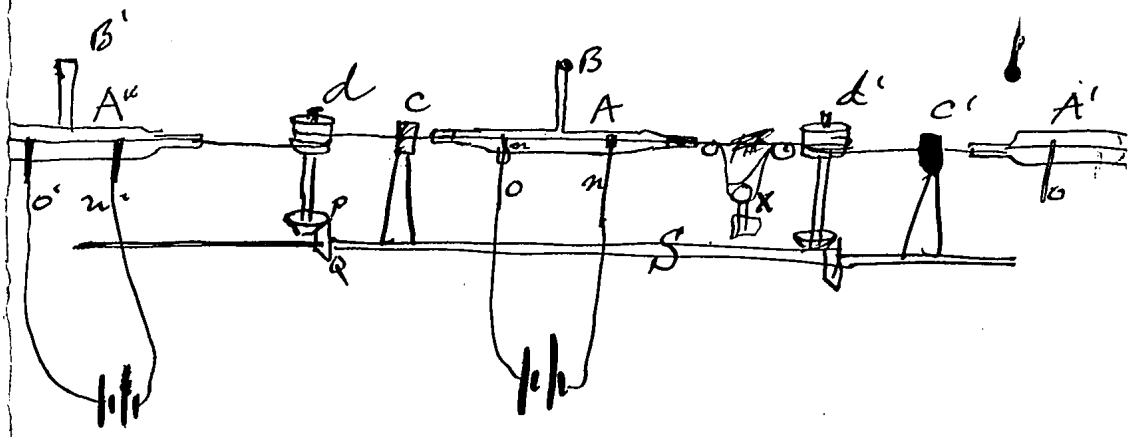
The Battery I prefer to use is the ordinary gravity Battery with moderately pure Zinc & Sulphate of Copper

I never make Broad claims for this method -

E

736

You remember I have two applications for drawing wire — one for annealing by a current & one by gas heat while wire is in a chamber — Both these have objections — ~~Take out of~~ put in a new application



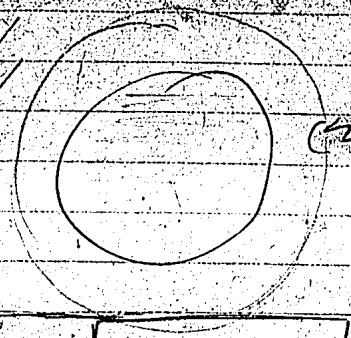
A is a glass tube filled through B with Hydrogen or other reducing agent under slight pressure. The wire passes through stuffing boxes at the ends - to the left it passes through the die C it is drawn along by the Revolving drum d by means of the shaft S & bevel gear p q —

O & N are contact springs which allow a portion of current to pass through the wire & heat it up to the annealing point. Oxidation being prevented by the presence of the reducing gas which serves to reduce any suboxide formed on the metal while passing through the air = a weight X serves to allow a little slack to compensate for the slightly different speeds required between each jump —

This process is for drawing Exceedingly fine Wire not now possible except at great Expense not very great lengths =

strong claims & Soak — Edwin

Oct 8 1951



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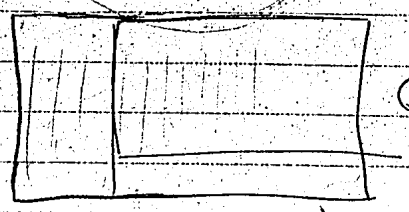

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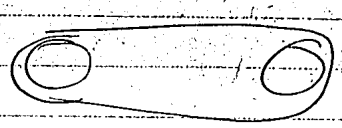
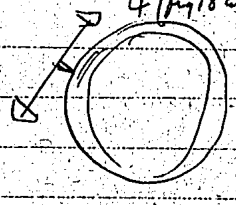


5 (fig 33 EP)
side elev



4 (fig 18 EP)

6

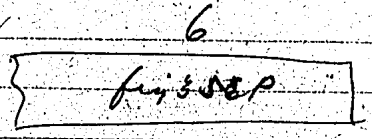


fig 3 EP

way
(1)
hatch

fig 3

1/32 precision 1/32 way

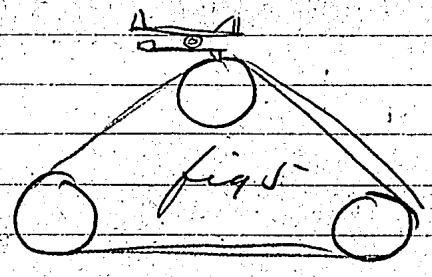


fig 5

Rec'd Oct. 22. 89
H.W. Seely

Orange Oct 20/89

The object of this invention is to diminish the amount of Copper in the distributing system of Central Station Electric Lighting so that large areas can be supplied from one central station without the use of large amounts of Conducting material and without the intervention of apparatus wasteful of Energy. The ~~[illegible]~~ direct connection of the translating devices. The Consumption of Energy being in proportion to the number or size of the translating devices,

In previous patents Nos I have shown a method in what is called the 3 wire system whereby the two sides of the system are balanced by causing ~~[illegible]~~ automatically or ~~[illegible]~~ by mechanism controlled Electrically from the

273
600
163800

4) 2.675
.669

.667

185000
.67
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1110
1239500.00

.67
1146600
9828
109746.00

156
900
140400
.67
98280
84240
94068

184
700
128800
.67
90160
77280
86296

Central station, a group of lamps to be thrown over from one side to the other, so that if it is found that one side has more lamps on than the other a definite portion may be ~~to~~ disconnected from so ~~the heavy~~ overloaded side & fed from the light loaded side so as to effect a balance in the patents opposed off — The present invention is an extension of the same idea & more applicable to large & very extended systems of distribution and on 4, 5, 6 or more wire systems, It being essential in any extension of the 3 wire system to a 4 5 or more wire system that the balance should be very even as above a 3 wire system the The difference of pressure due to out of balance is in certain conditions not regulatable by varying the resistance of the feeders

and as it is a great saving to use very small neutral wires in the feeders it is necessary that the balance should be such at all times that only a comparatively small current shall ever pass through them; Hence it is essential that in a large area a large number of ~~switching~~ groups at different points should be capable of being connected to any circuit without running a great number of separate circuits to the switching mechanism ——

The mountain consists in placing a number of boxes throughout the district containing switching mechanism each controlling all the lights in a certain house or store, The boxes are placed preferably on the poles like fire alarm boxes ——

Each box has two Electro magnets, one large the other small. — If there are 20 boxes a circuit of ordinary telegraph wire runs from the station through all the small magnets, Fig 1 another circuit runs through all the large magnets, the 2 extreme ends are connected to the outside wire of the system, at the station there are two dials C C' worked by magnets, 2 keys K K' serve to open & close the circuit, R is an adjustable resistance, the two circuits joint are connected to the other side of an dynamo thus giving 100 volts to each circuit.

Fig 2 shows the switching mechanism a is a ratchet wheel with a greater number of teeth than there are boxes in the circuit — d the click. H the magnet lever K the retractile spring

L the limiting screw M the small magnet n the backlash click; c the locking check stop.
on the shaft carrying the ratchet is a disc b with a notch a the notches in each disc in every box is in a different part of the periphery of b, except at one point, where the M' mechanism is to be effectual
f is the unison arm g the unison stop pin — m is the unison releasing arm connected to the lever S of the large magnet M'
Thus if the Operator at the central station taps the key of the small magnet current a number of times the rotation of the ratchet shaft will cause the coarse screw to advance the unison arm up to the unison pin & stop further rotation — now by depressing the key of the large magnet current once the arm m throws the arm f upwards & a spring pulls it back to the other extreme of the screw on the shaft — Thus all the

Ratchet mechanism controlled by M in every box can at any time be brought to a definite point & be in unison —
When in unison there is no notch opposite R or S in any box —
But there is sufficient space for R to work from its position opposite to the periphery of the wheel to trip the Unison mechanism
Having brought all the M mechanism to unison — the M' mechanism can be brought to unison, the disc may be advanced to such a position where the Notch Q is opposite R of every box ~~but not to other box~~ —
The large magnet circuit is now worked and as T' is a similar unison the lever T will soon reach the unison stop pin & stop further rotation on working M the lever p of tt release the unison & both magnets

systems are in unison. ~~[illegible]~~
~~a one tooth further the ratch~~
~~in box 2 is opposite~~

Supposing all the boxes have both mechanisms in unison, The Customer or house are connected permanently among the boxes No 1 box when in unison has the house on No 1 circuit No 2 box on No 2 circuit & so on So that in practice The houses will be connected to balance each other when the mechanisms are all in unison at one point,
about 1 box for every 15 houses will be enough in practice (10)
10 lights controllable will balance every 150 lights uncontrollable,
3 is the switch ratchet, 4 the click
1 & 2 are rings one ring connect to spring 4 & one to spring 4' The spring being split around the shaft so that two halves are electrically insulated from each other - on these rings.

But two springs W.V. wires from these springs pass to the horse where the lamps or other translating devices are connected in multiple are — 6 to 12 are contact plates on a insulating disc 13. These plates are connected to the 5 wire system as shown in fig 3. By the rotation of the switch shaft the group of lamps on W.V. are successively thrown on the 4 circuits, by advancing 4 points, owing to the use of an electrolytic motor. The other half of the revolution cannot very conveniently be used here to bring the group of lamps back to the 1st circuit. the mechanism is not allowed to rest on the other 4 plates but the arm 4' is brought back to their original position

~~fig 4 sh~~ 9

fig 4 shows the box on the pole
1 2 3 4 5 are the wires of the 5
wire balance system X X are
insulating pieces in the circuit
to cut in the large & small magnets
in circuit, 8 & 9 are pressure
wires - etc —

fig 5 shows Unison mechanism
& disc 6 with notches in
different positions.

Now supposing the system balanced
& all mechanisms of boxes at
Unison — ampere meters fig 1
on neutral wire shows no current;
now supposing a consumer
shuts off his lights on circuit No
1. the balance is destroyed & a current
passing through one of the neutral
wires to station deflects the ampermeter
& shows say 30 lights —

or several customers whose aggregate amounts to 30 lights have shut off —
The Regulating Operator, looking at his dial C & C' fig 1 works the Key and working the mechanism previously described disconnects by ~~3 boxes~~ 2 or more boxes sufficient lamps from the other 3 circuit & connects them to Circuit No 1 to balance the system which is immediately apparent to him by the action of his ampermeter.
This mechanism can be used to disconnect contract customer feeders at a distance, Transformers & in fact every kind of apparatus I do not wish to confine myself to putting the boxes in series so all the small magnets may be worked in Multiple arc ~~on~~ one ckt & the large mags ditto — in fact both magnets may be

Polarized & put in or across one circuit & a ~~polar~~ current of one polarity intermitted work one magnet & the opposite current intermitted work the other magnet,
Instead of the keys - a rotating transmitter with break wheel & dial as in printing telegraph may be substituted
The feeder as a whole has its general pressure regulated by feeder regulators in the ordinary way —

Claim the Earth —

Elisha

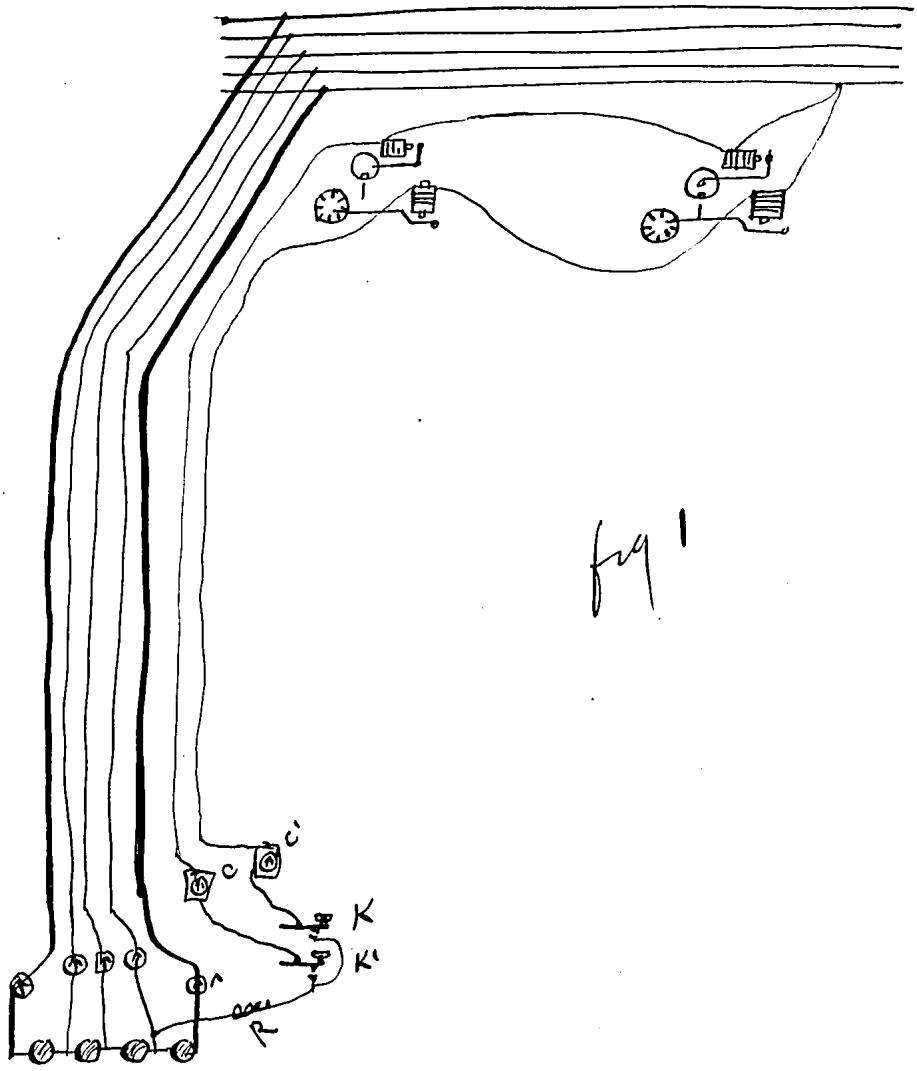


fig 1

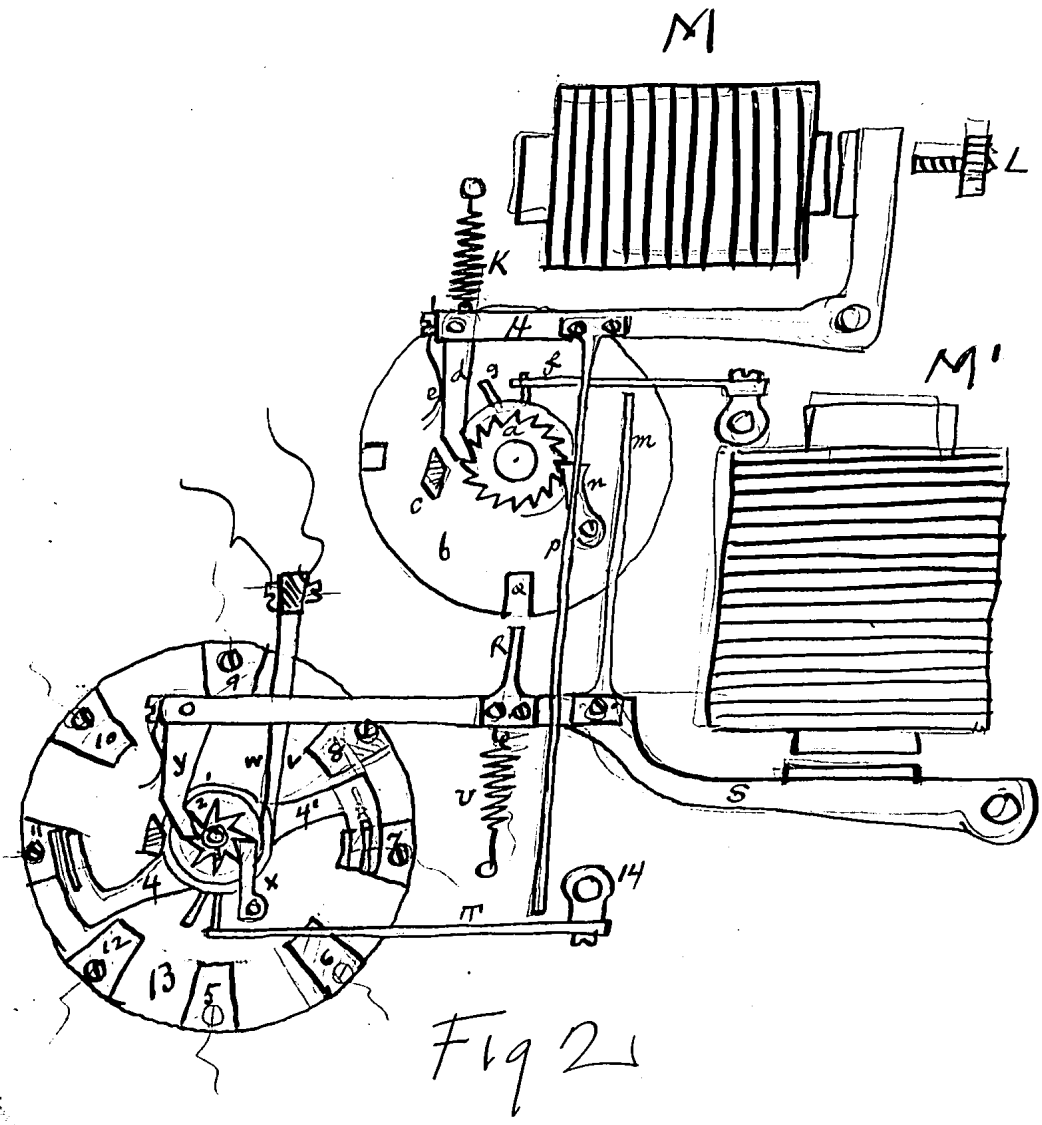


Fig 2

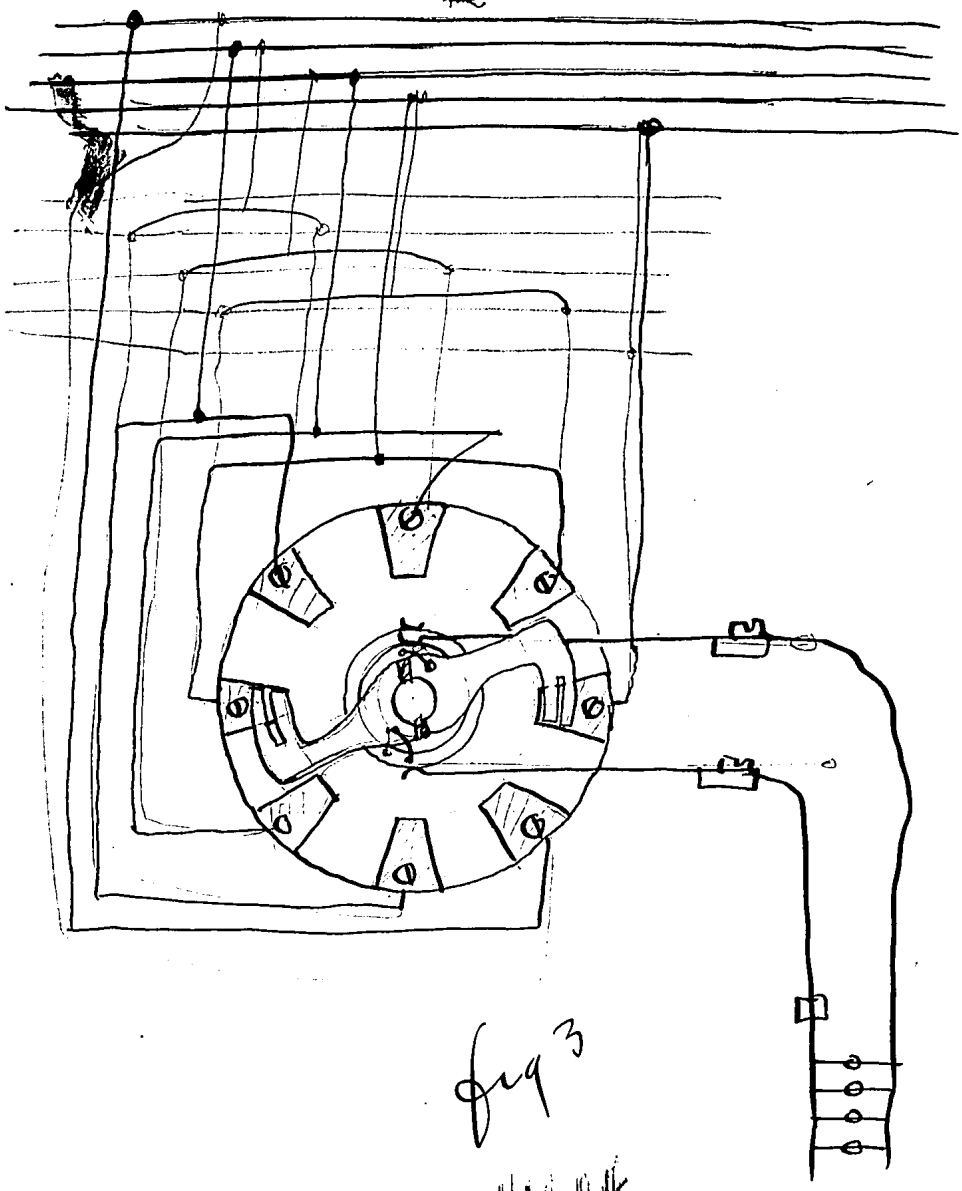


fig 3

Rub out the pencil [illegible]

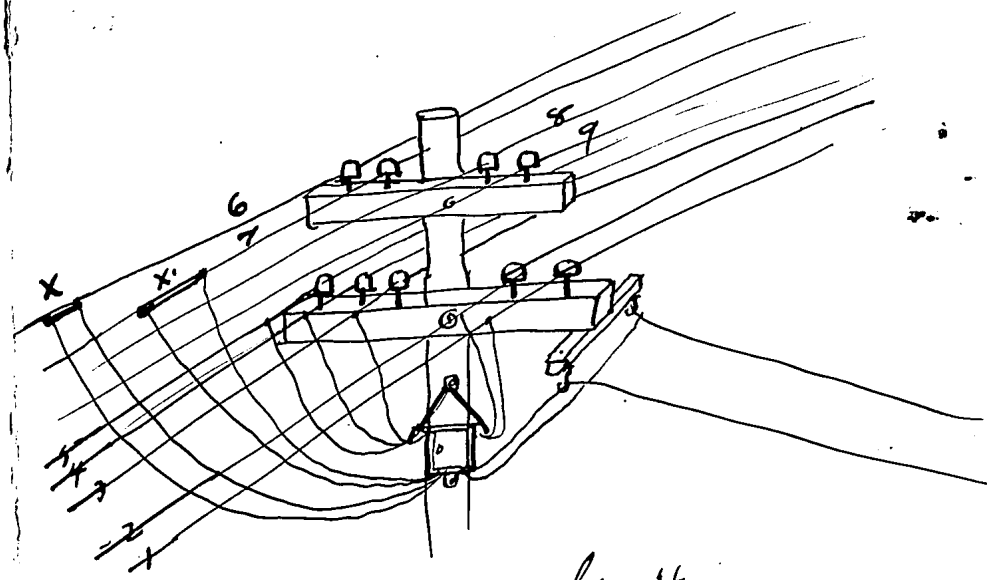
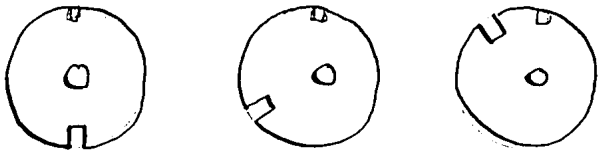
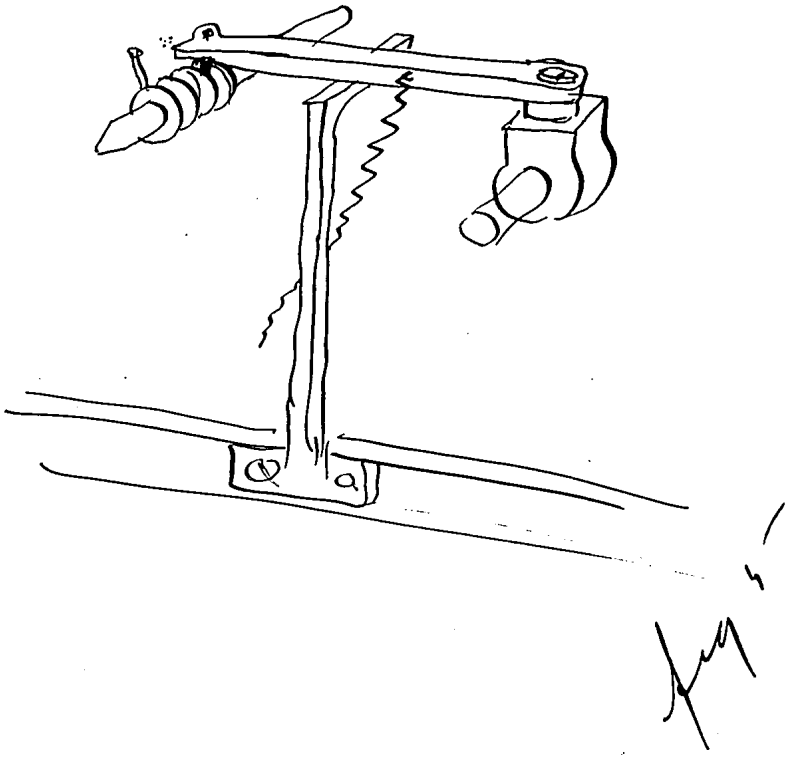


fig 4





Questions [illegible] about
vaccination [illegible]
[illegible] related
[illegible] could
[illegible]
[illegible]

[illegible]

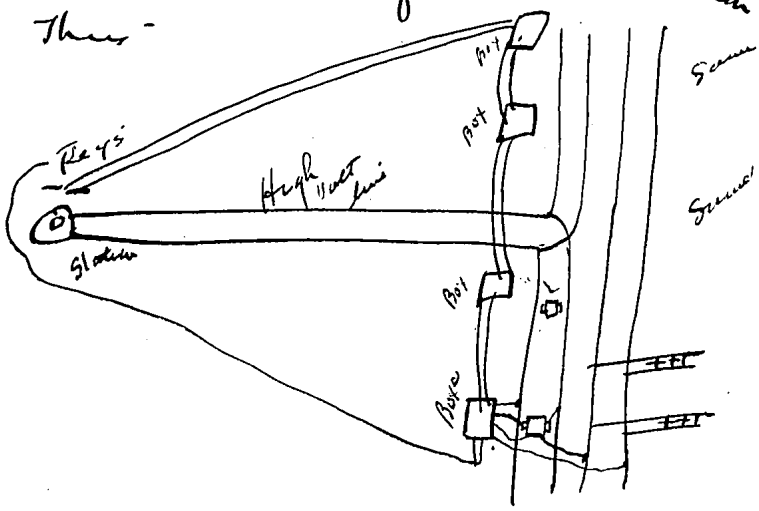
From the Laboratory
of
Thomas A. Edison.

Rec'd Nov 1 87
H. W. Seeley

Orange, N.J., Oct 29 1887

Dick—

Please fix up another Case with the shifting ratchet wheel device & apply it to transformers. The object being to disconnect & connect transformers as the load diminishes or increases all from the station. Thus—



From the Laboratory
of
Thomas A. Edison.

Orange, N.J., _____ 188

2

You know the trouble with the alternating system is that while the sale of light is usually all in 4 hours the loss in the transformer which is 8 @ 12 per cent according to construction goes on during the whole 24 hours & the loss in some cases in the transformer equal the sales so you see it is a great stride in the direction of economy to connect & disconnect transformers as the load varies — get a strong claim on this head on the great economy etc as I am certain they will run a foul of this before long — Bill to Light Co as to for protection purposes

Edison

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Thomas A. Edison.

Orange, N.J., Oct 29 1887

PS –

You might show separate circuits running to each transformer from station with magnet to central switch. also a hand switch at each transformer to disconnect –

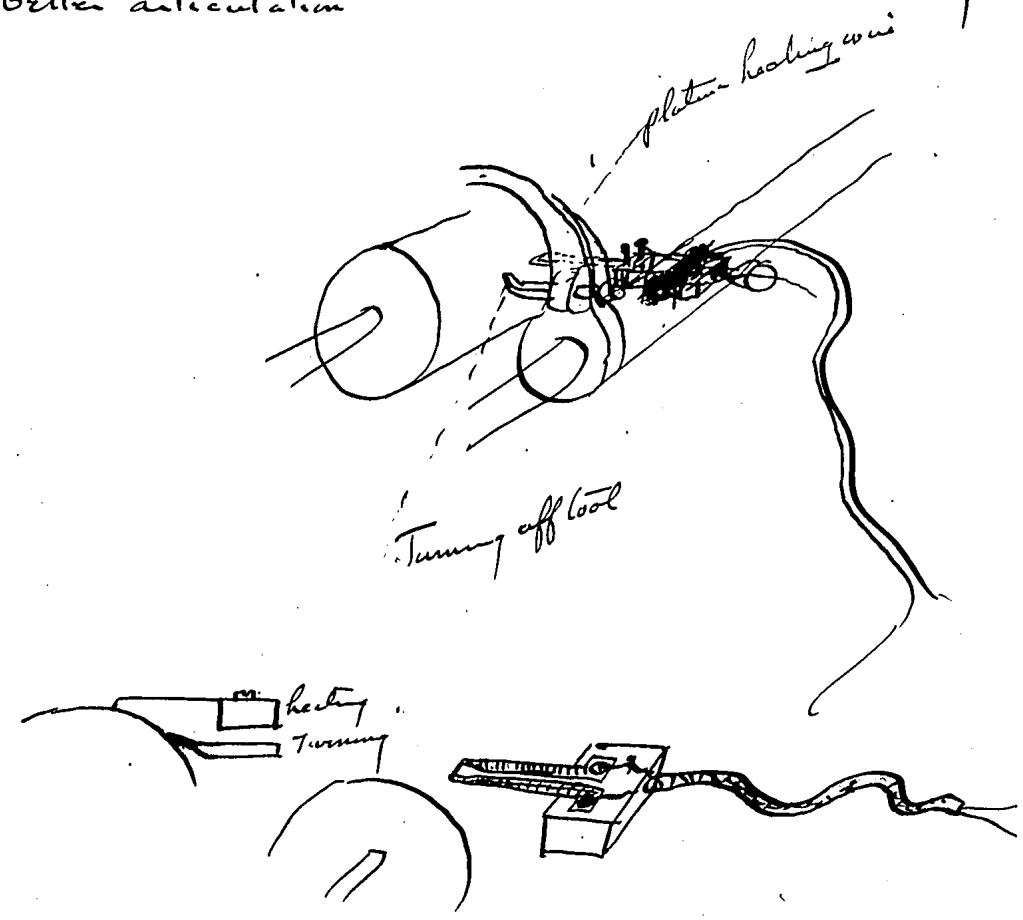
also a time clock controlling a switch to disconnect at any prearranged time – If this can't be put in one patent make 2.

E

Orange — Nov 17/87

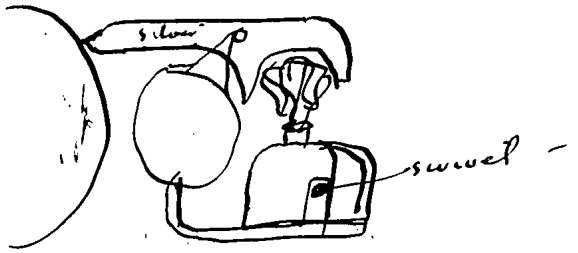
Dyer —

Be sure & incorporate the following in foreign & US patent — it works beautifully diminishing the roughness of the surface & giving better articulation

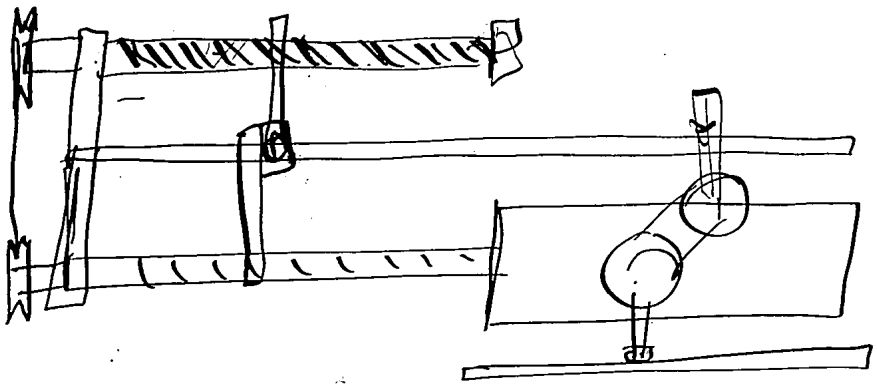


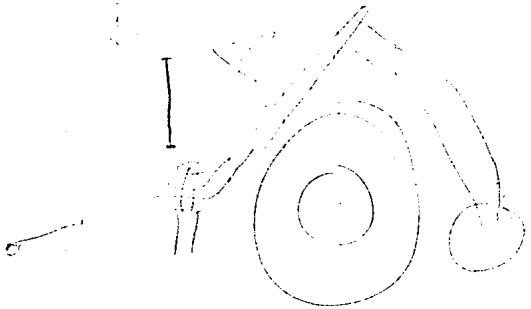
Both the turning tool & heating pulleys are adjustable, I find that the wire is kept sufficiently hot by using a shunt around ~~[illegible]~~ two of the 4 cells of the battery & the speed of the motor is not diminished by reason of it. It should be just hot enough to melt the outer surface of the wax, it obliterates the tool marks & gives a burnished like surface & is a great improvement. It can be cut out of sheet or a short length of .008 wire used.

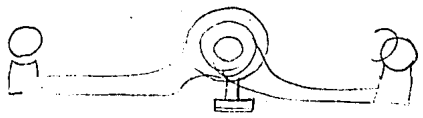
You better mention that an aluminum or silver wire of $\frac{1}{8}$ dia reduced to $\frac{1}{32}$ at the wax may be used & heated continuously by a minature alcohol lamp travelling with the traveller may be used the heat passing to the point & wax by conduction.



Nor [illegible]
R. N. [illegible]



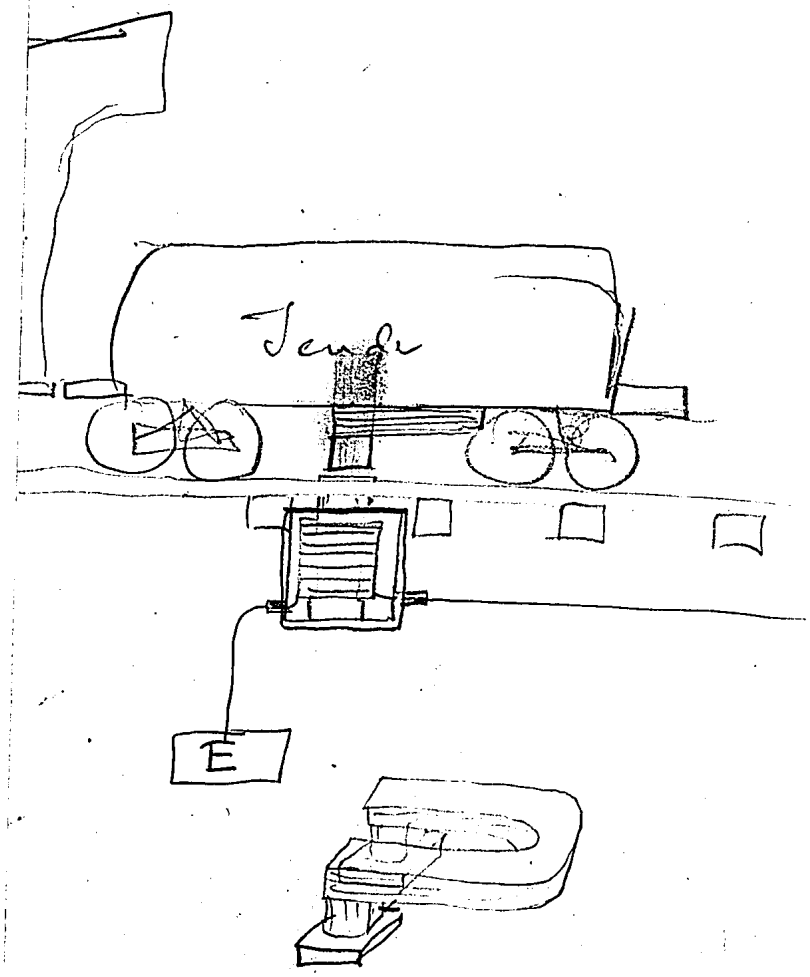


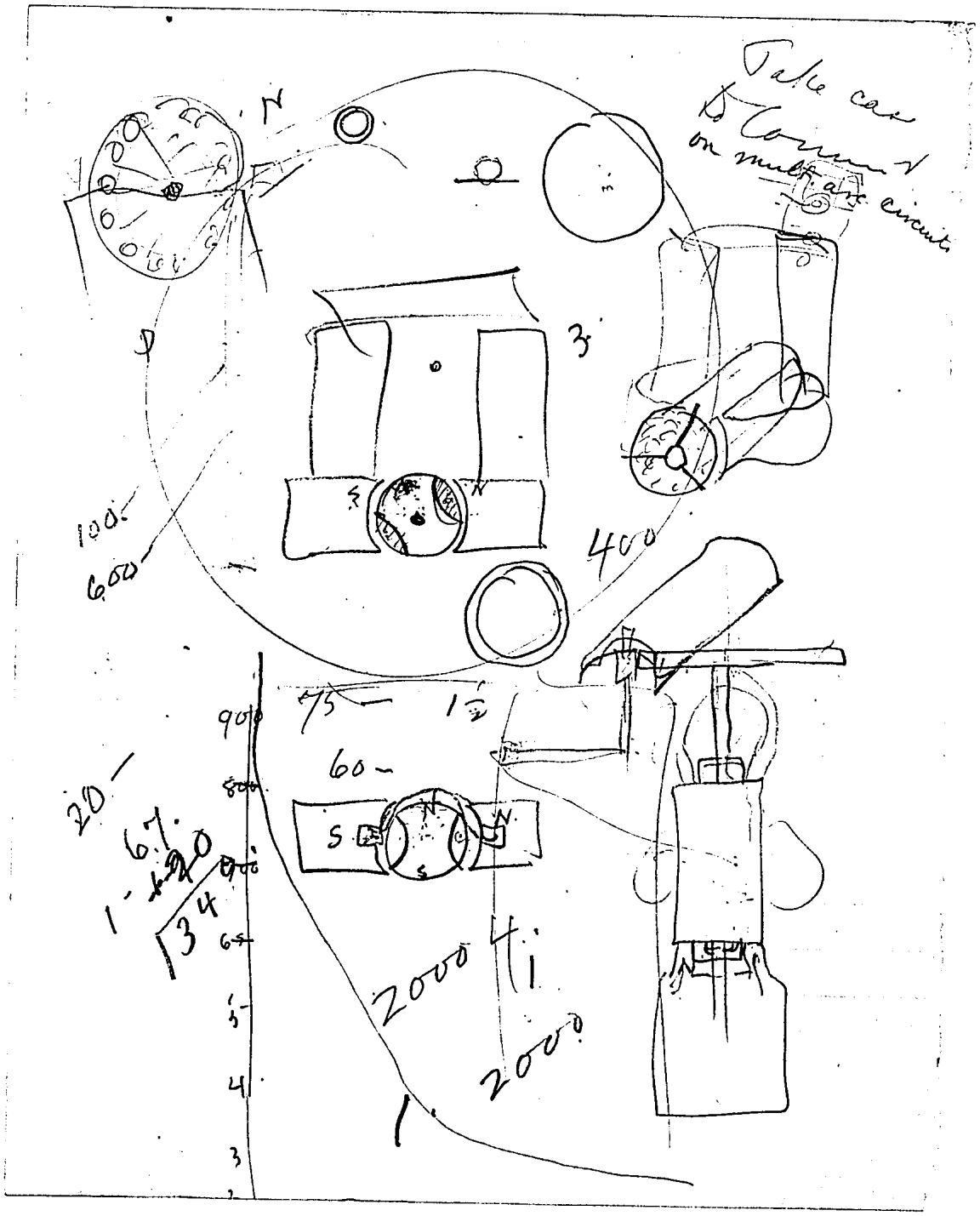


EDISON LAMP COMPANY.

THOMAS A. EDISON, President.
FRANCIS R. UPTON, Gen'l M'g'r & Treas.

HARRISON, N. J., ... 188




Take care to connect on multi-arc circuit
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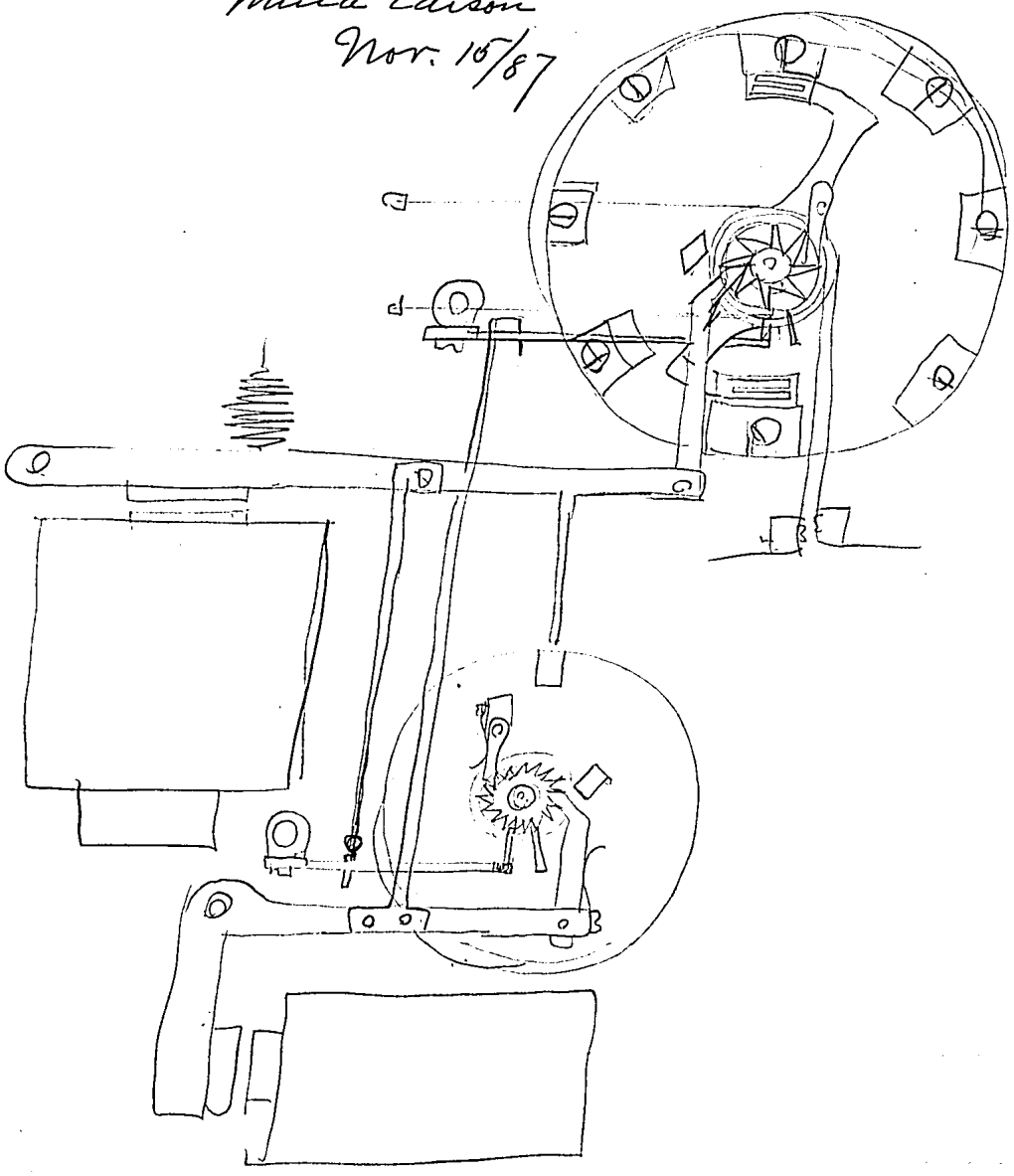
Look
up type
which part.
Butler

Maria Edison
Nov. 15/87



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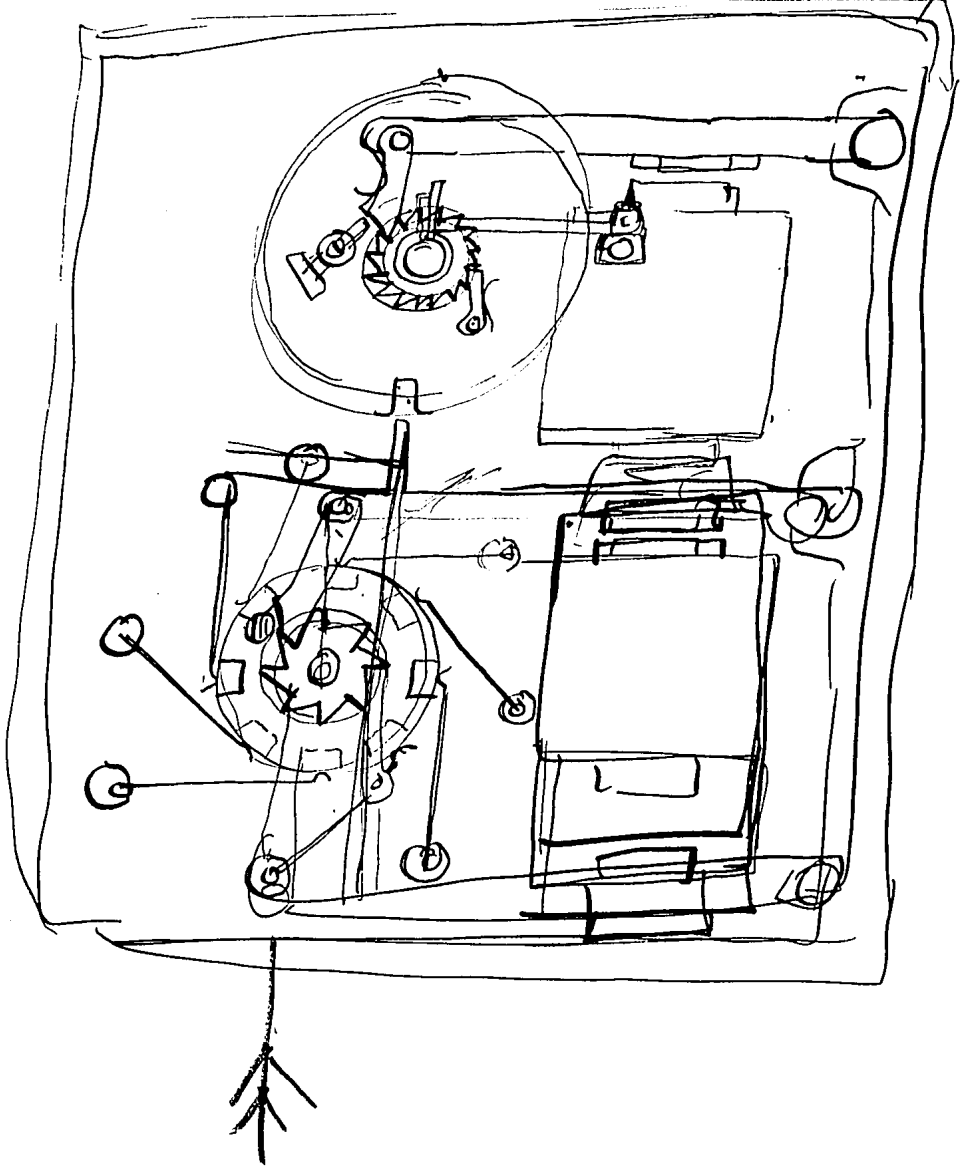

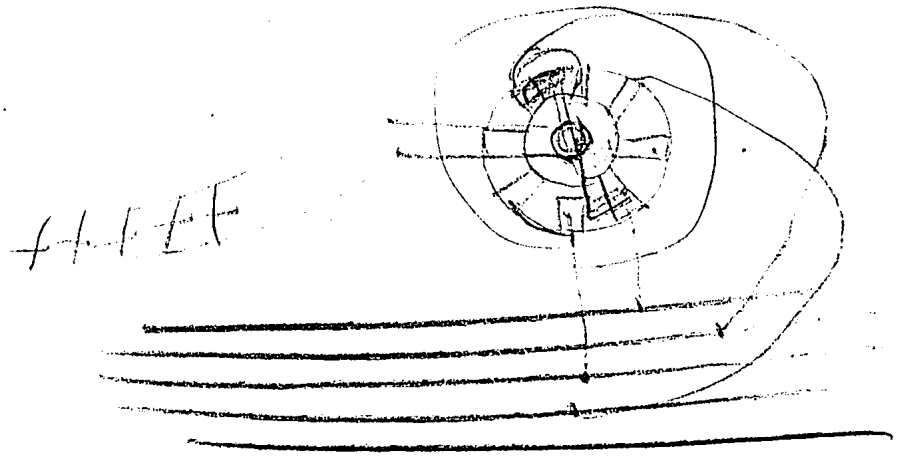

Mina Edison
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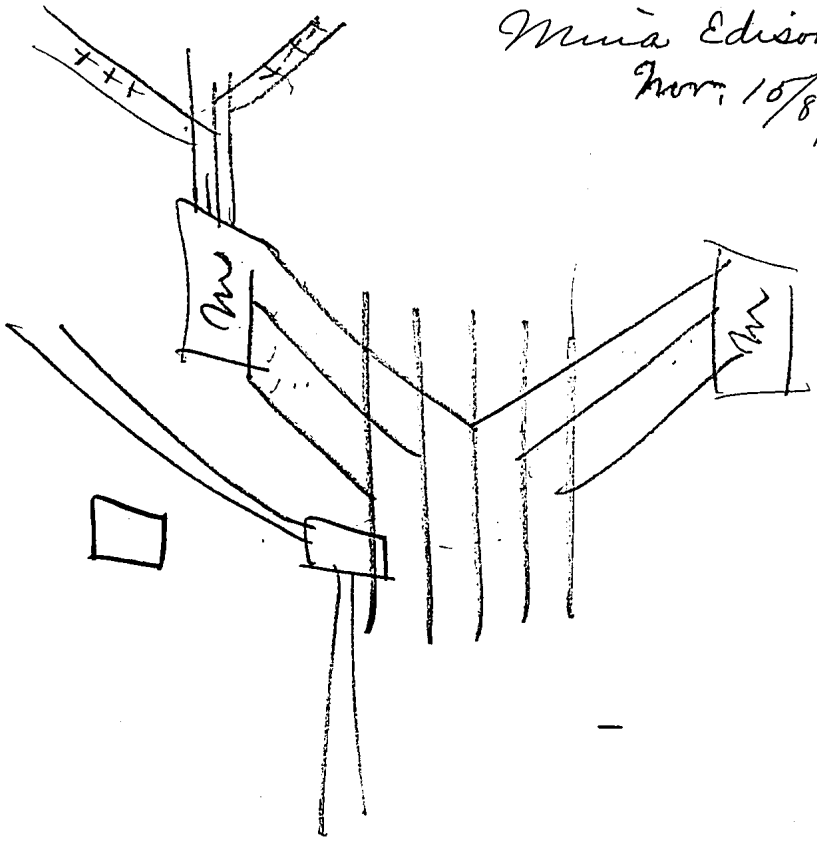

Maria Edison

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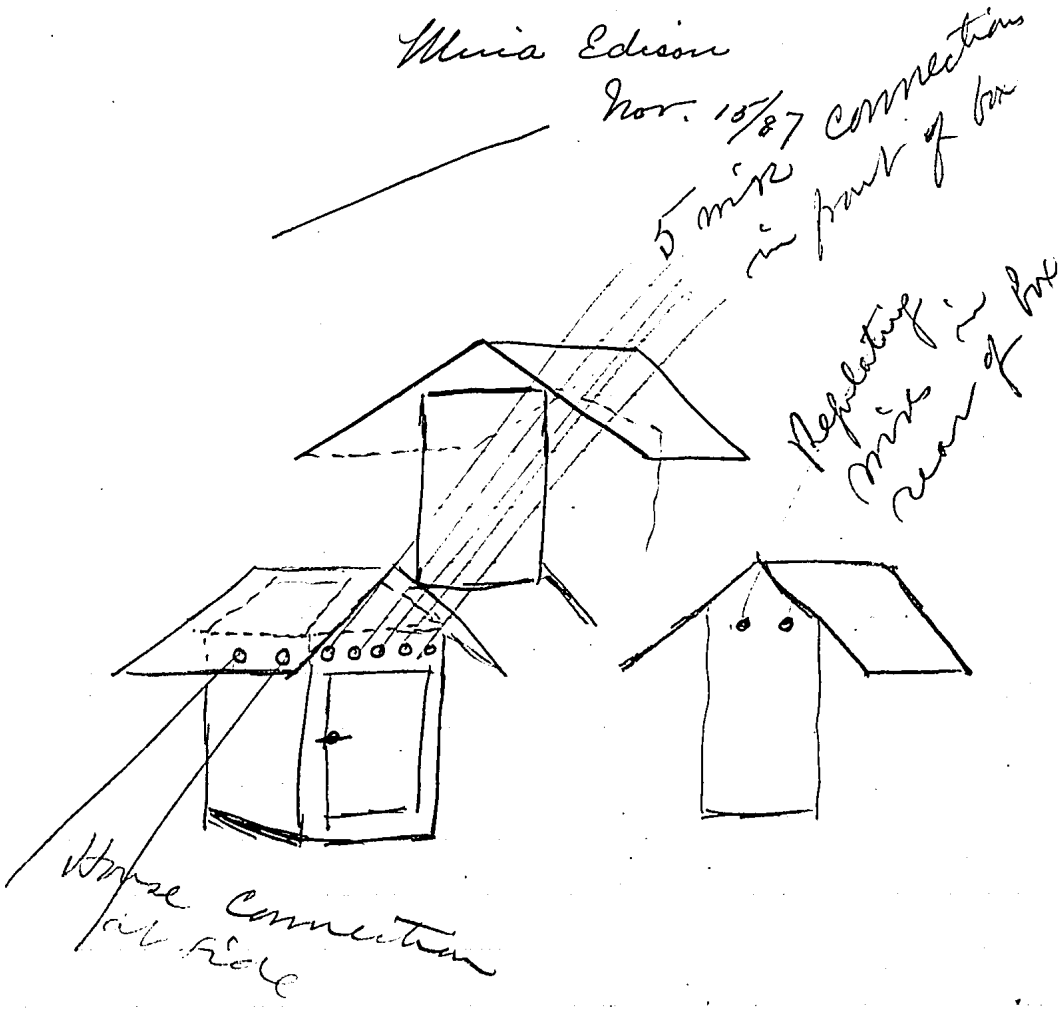

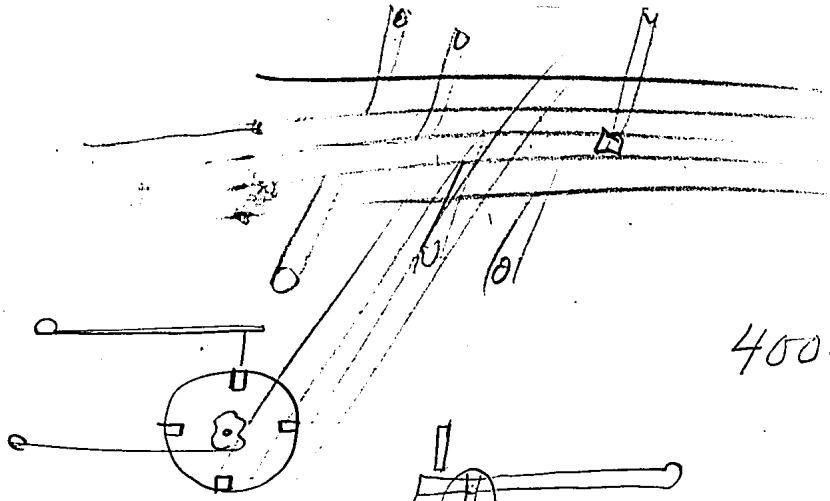

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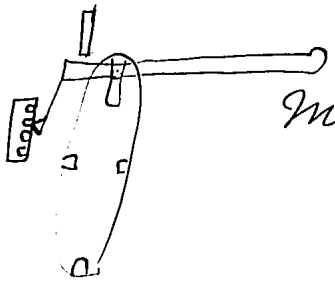

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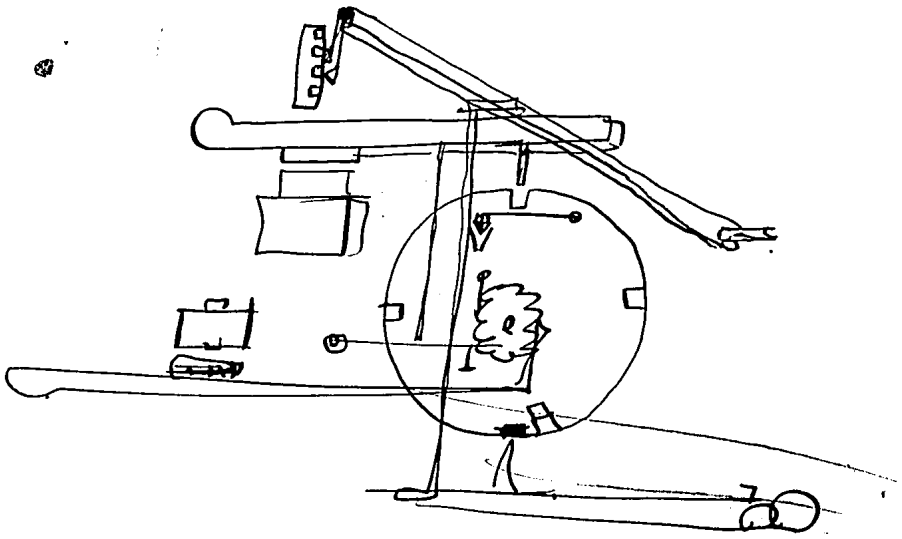

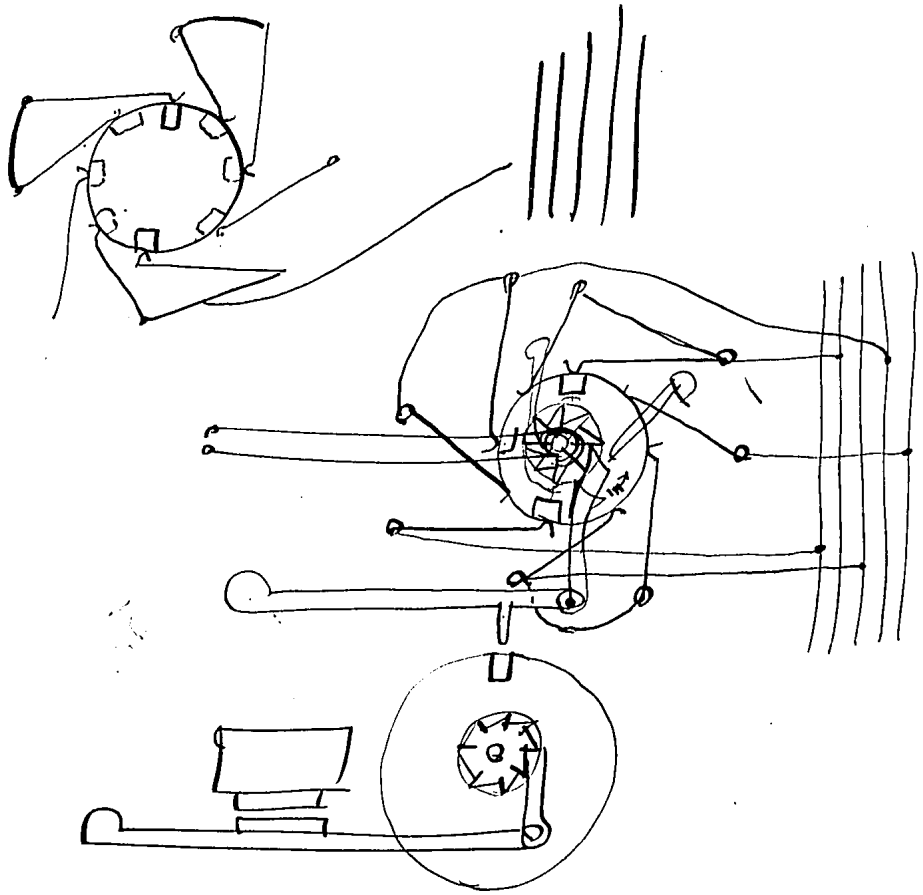

Mina Edison, Nov. 15/87

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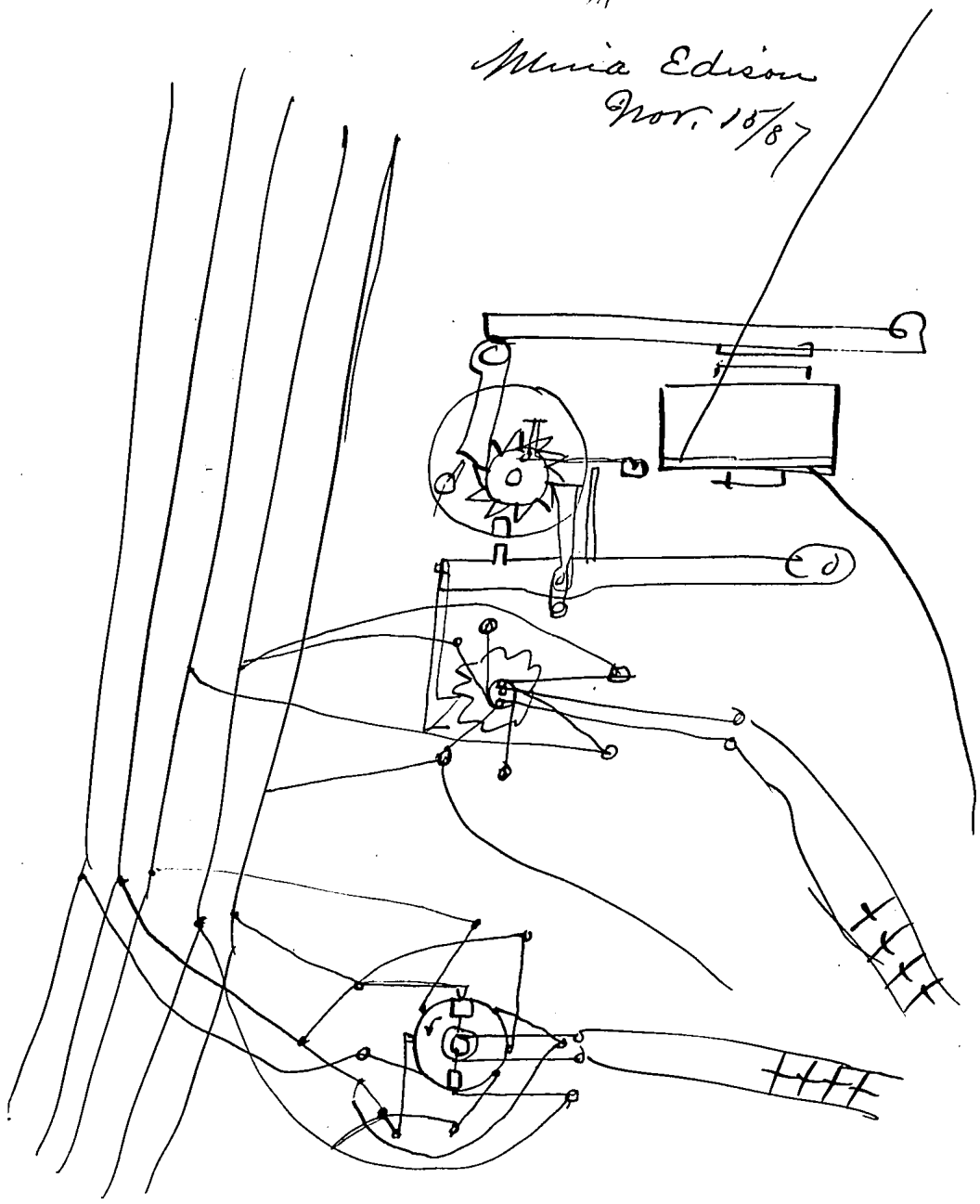
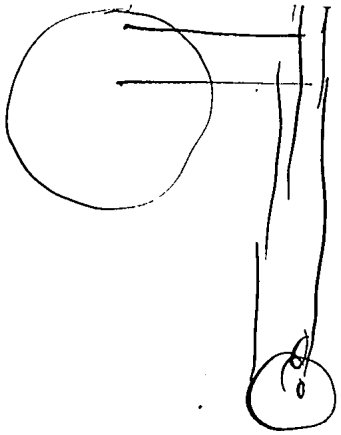
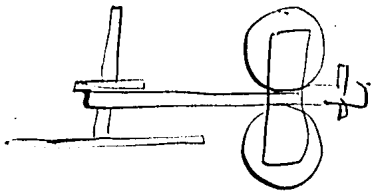
Thos Edison
Nov. 18/87







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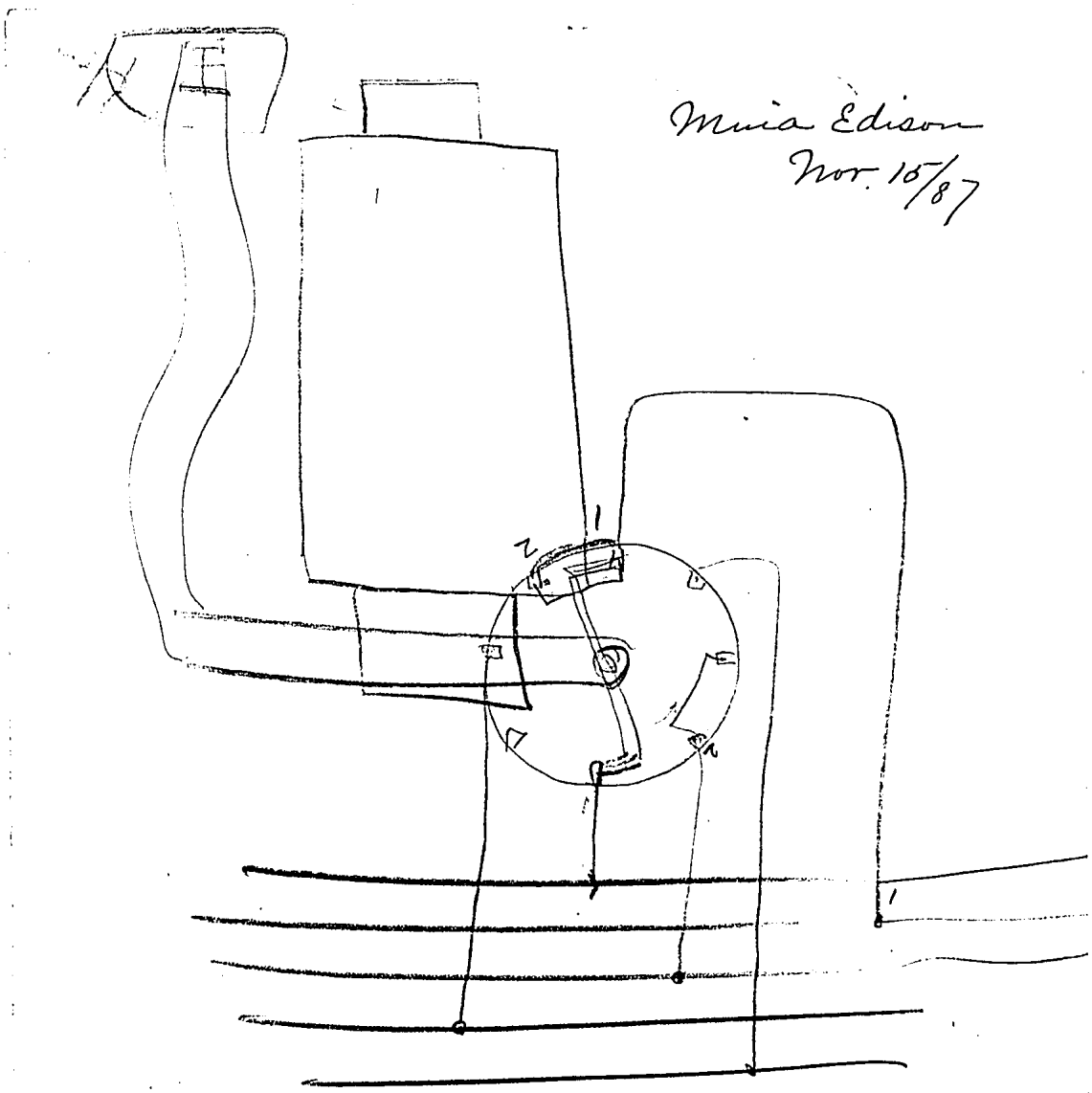
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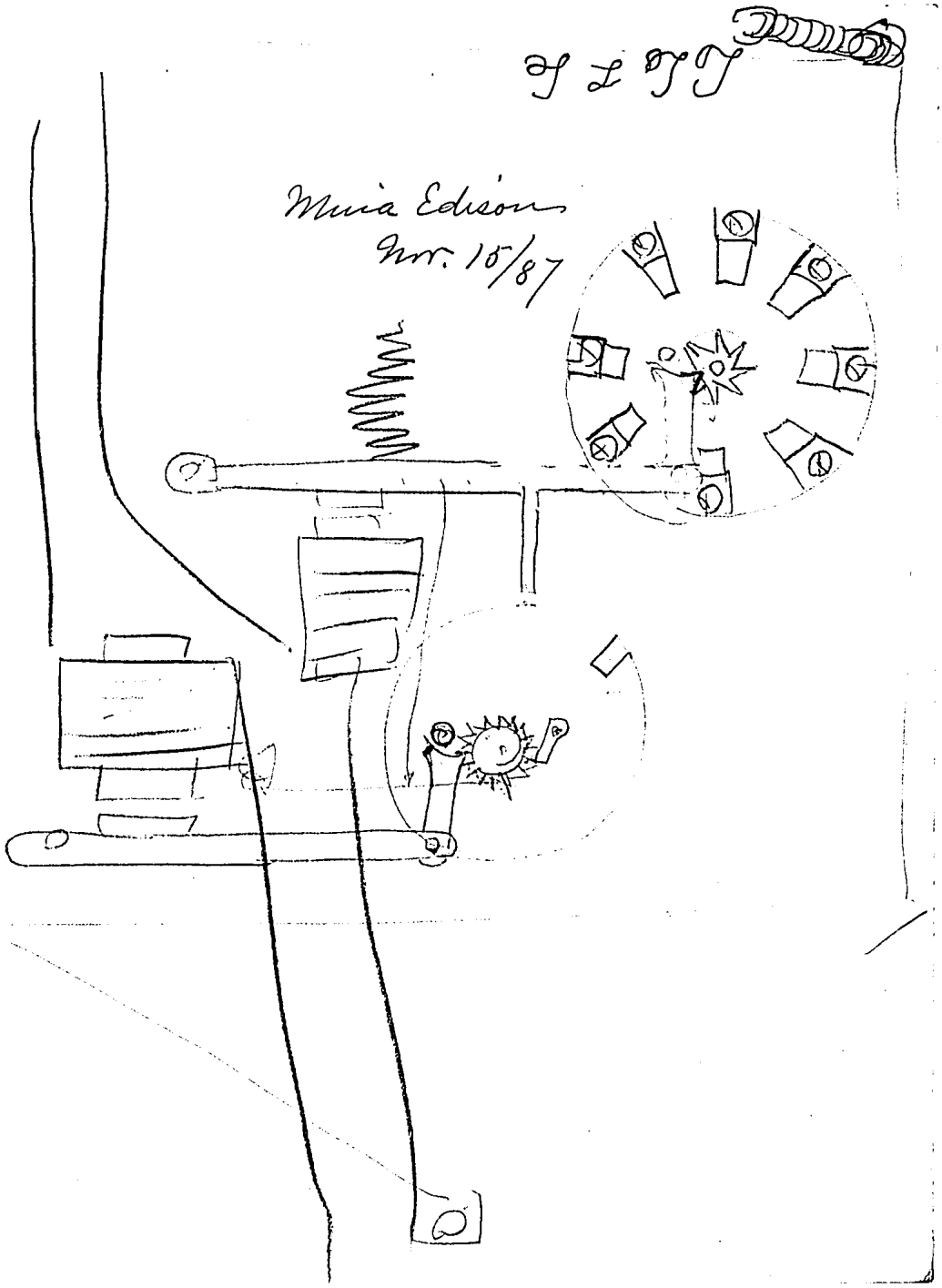
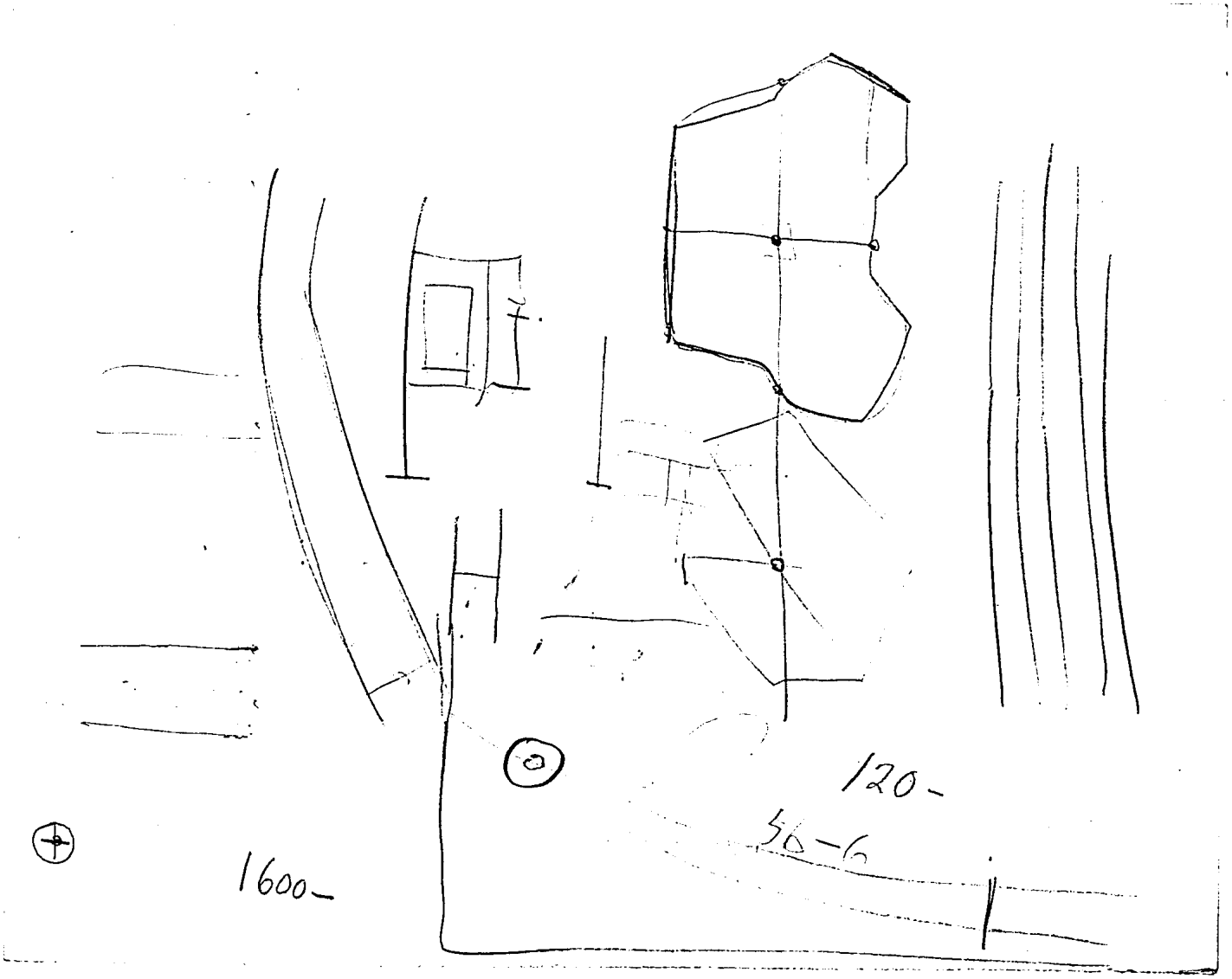
Nov. 10/87

Mina Edison
Nov. 28/87

Fig 2

Maria Edison
Nov. 15/87

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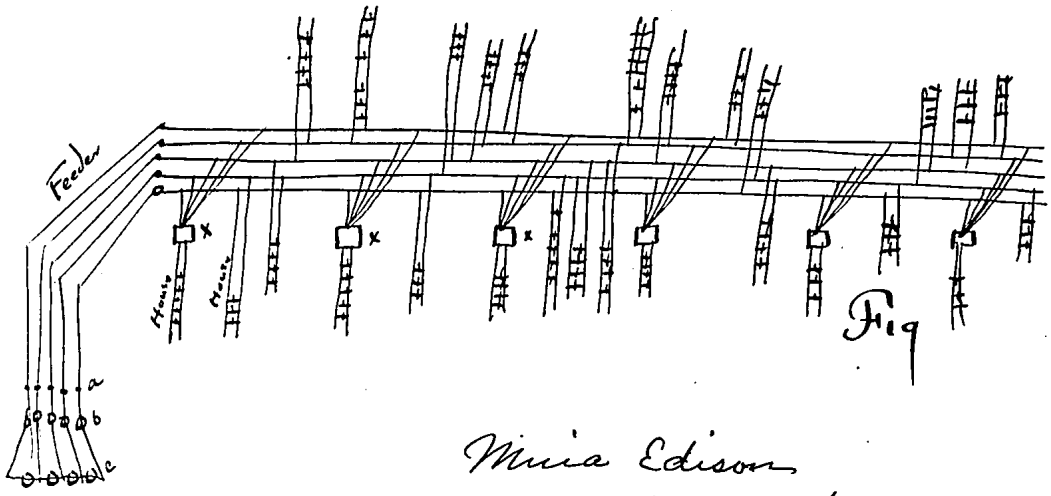

Fig

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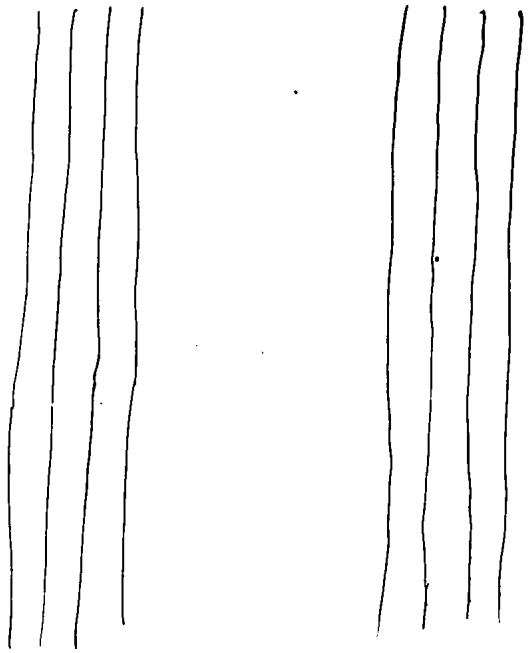

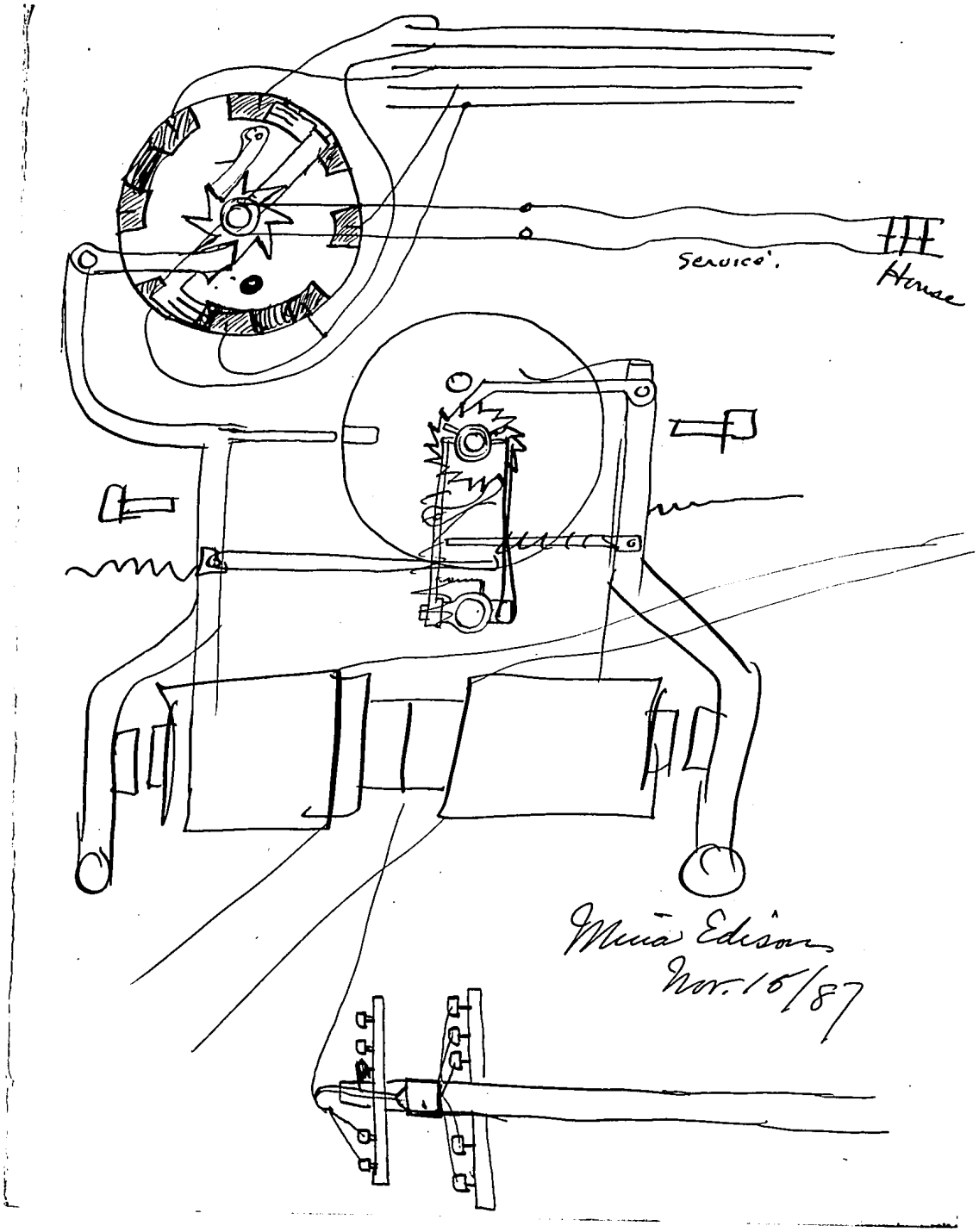
Service.
House
Mina Edison
Nov. 16/87

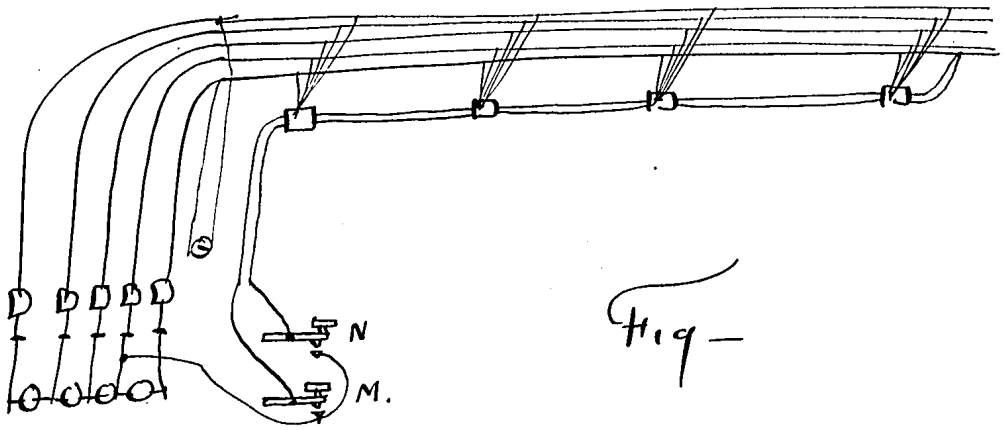

Fig –

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Nov. 15/87

Mina Edison
Nov. 15
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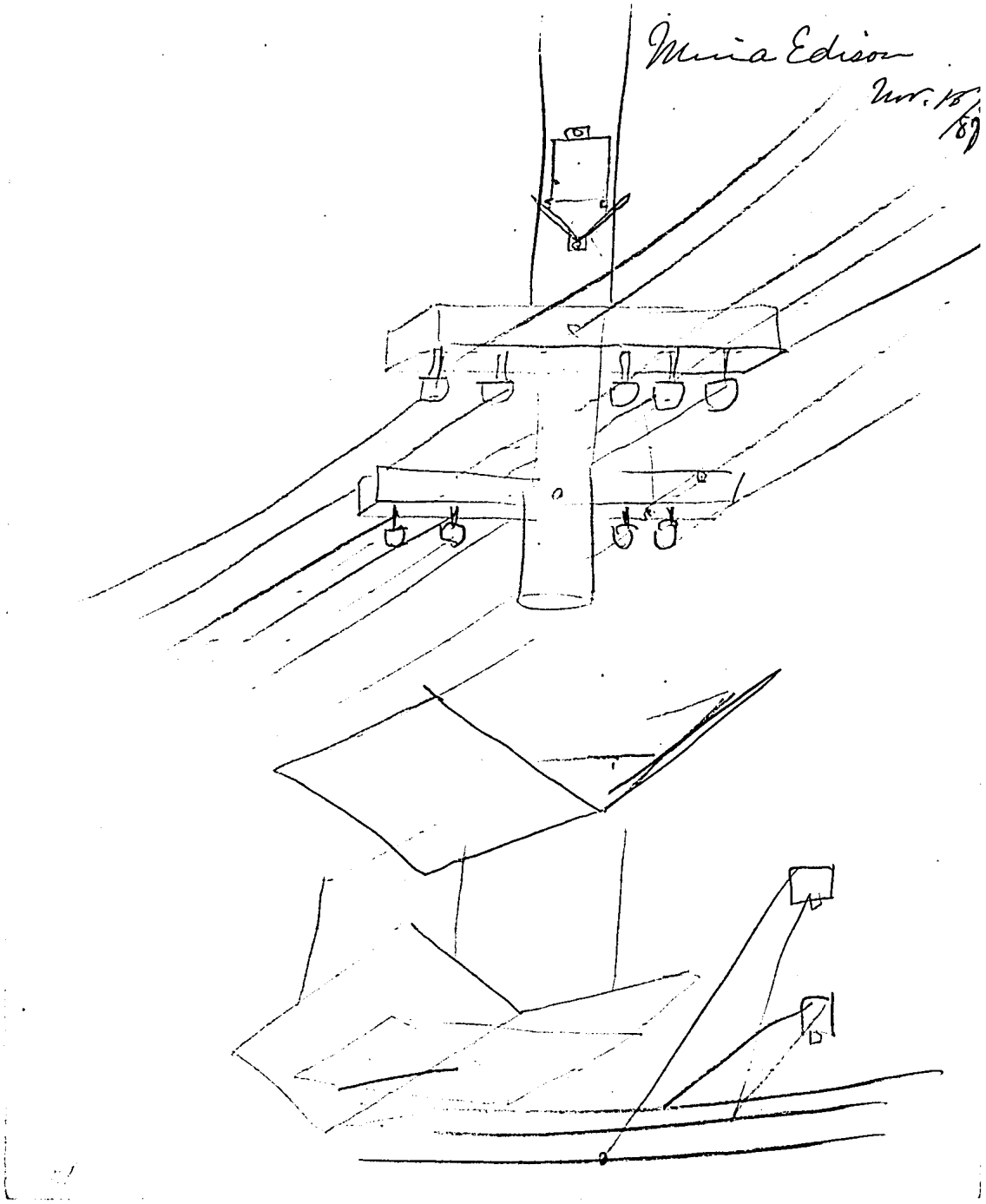

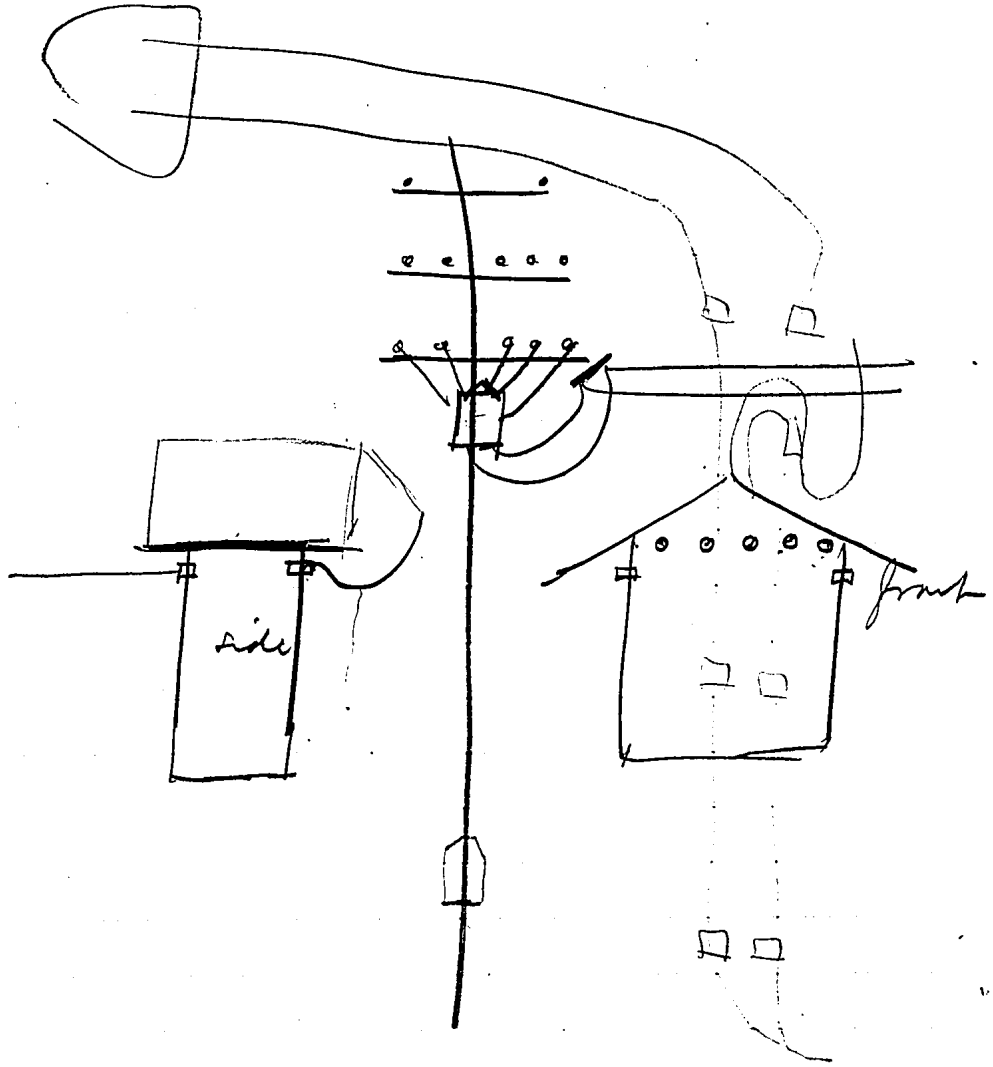
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of
Thomas A. Edison.

Mina Edison
Nov. 15/87

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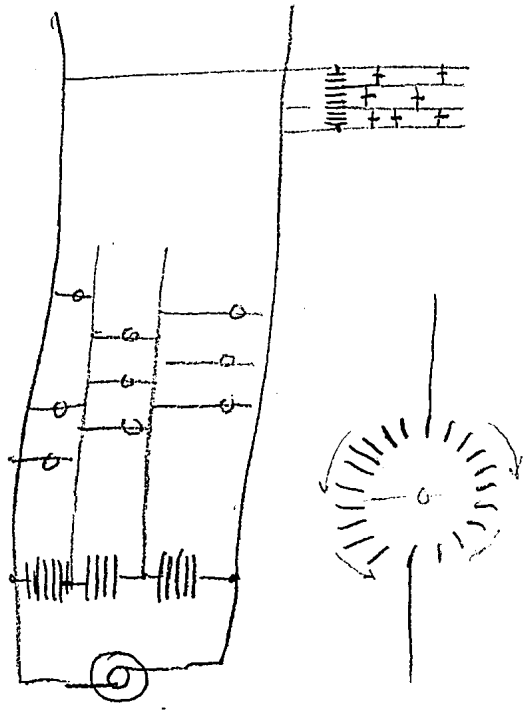

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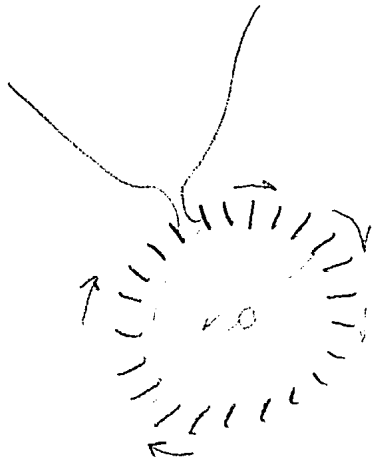
Nov. 15/87



Cable Address "Edison, New York."

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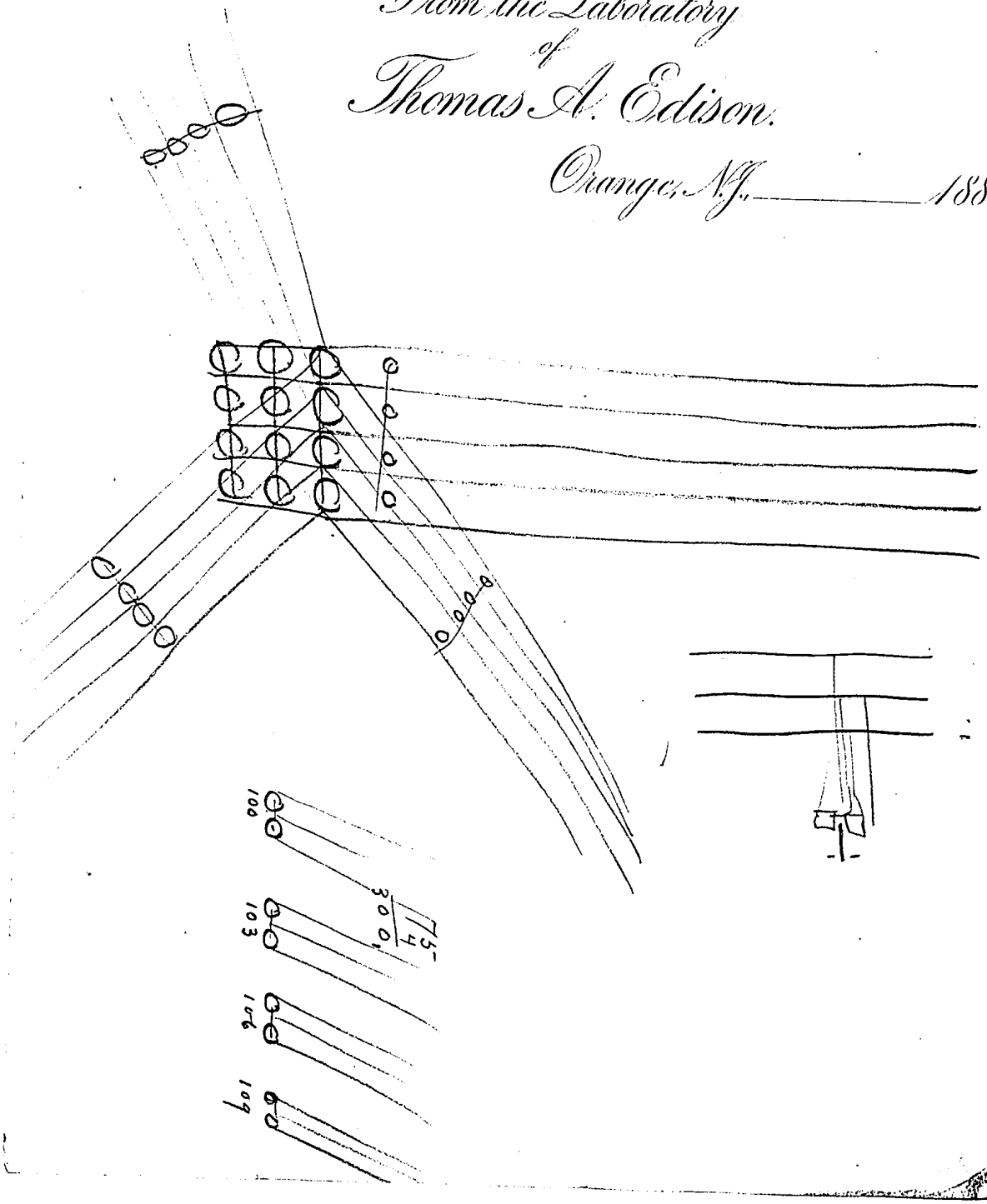

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Nov. 18/87

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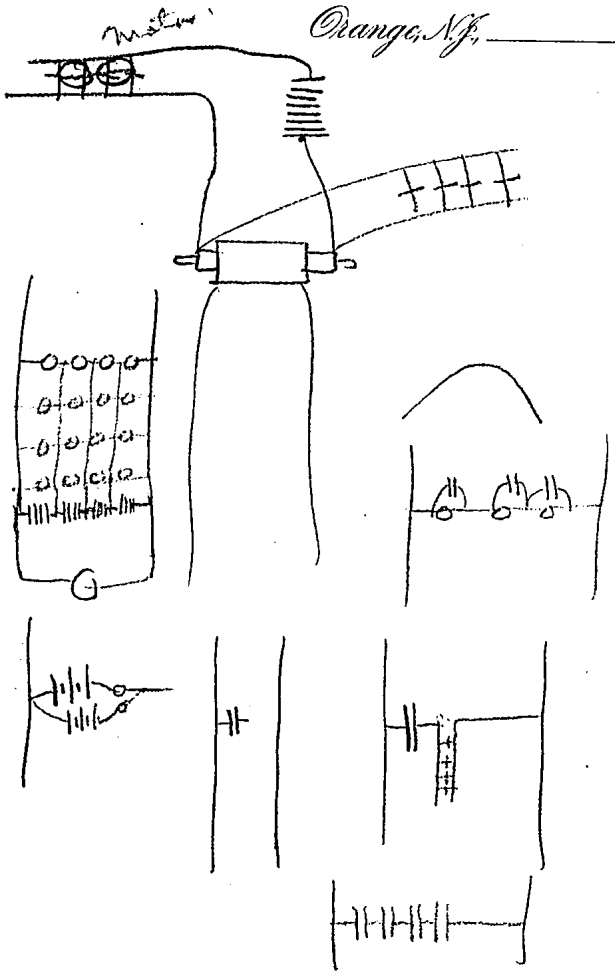

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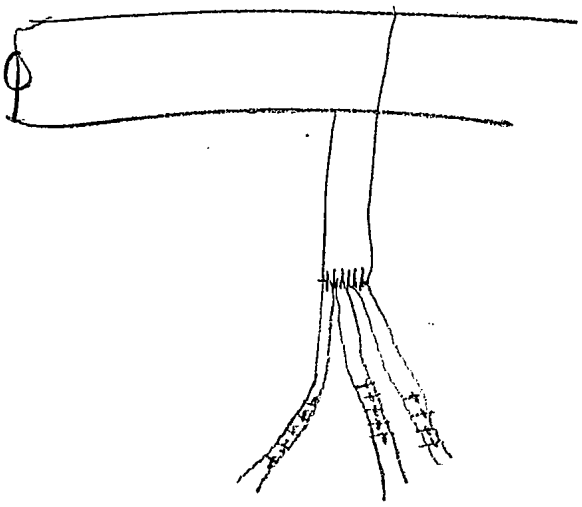
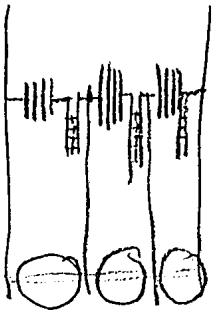
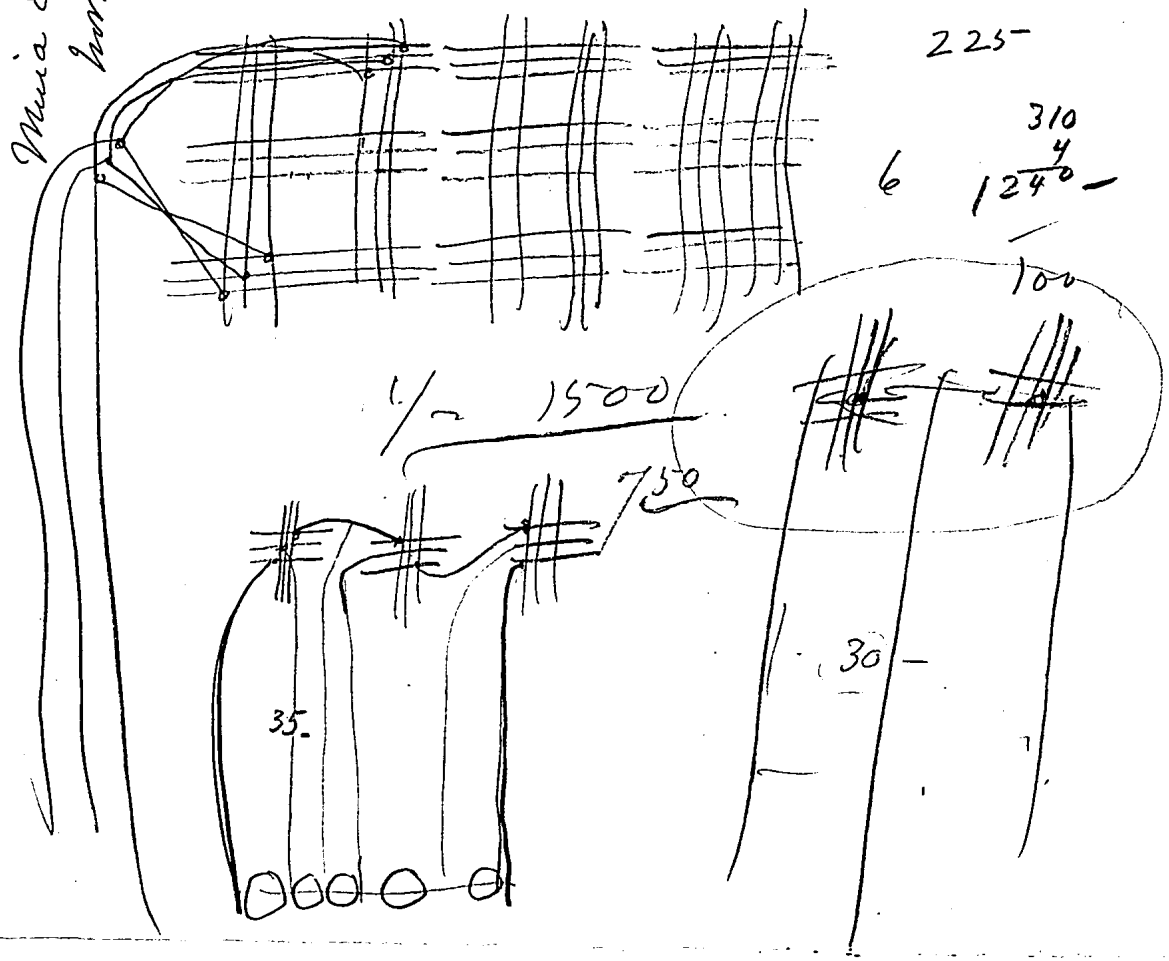




Maria Edison
Nov. 10/87



Maria Edison

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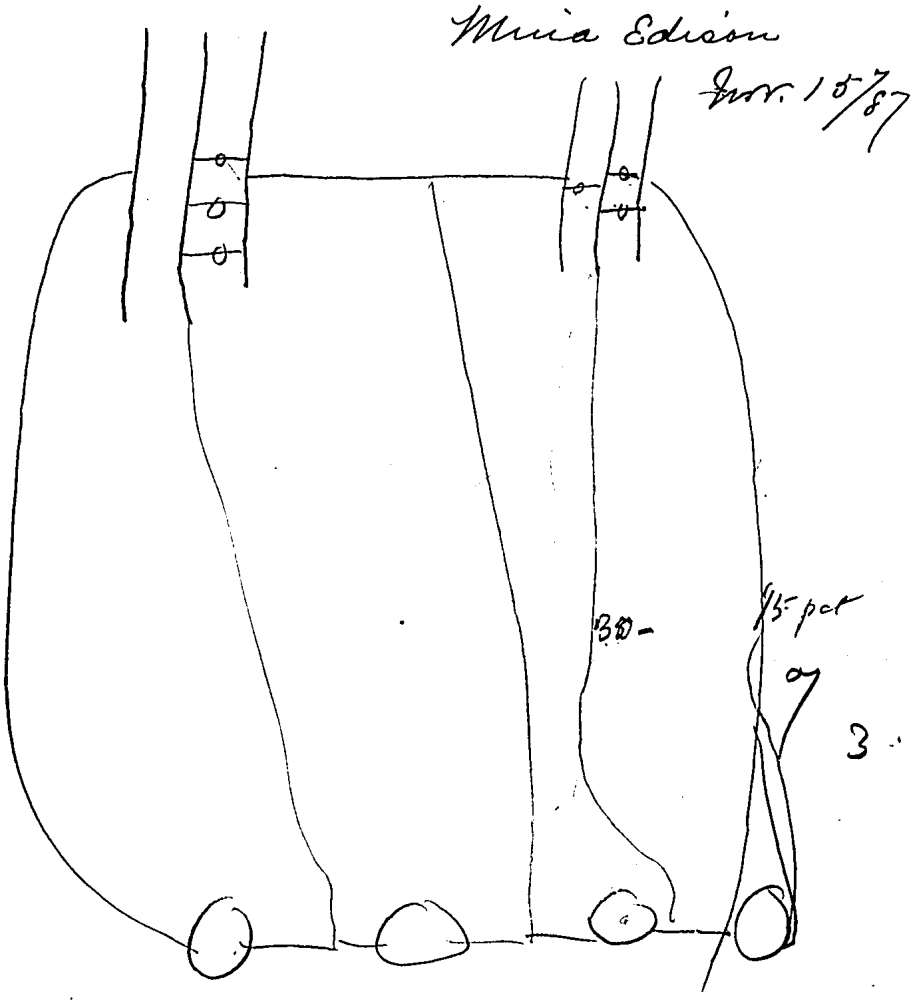
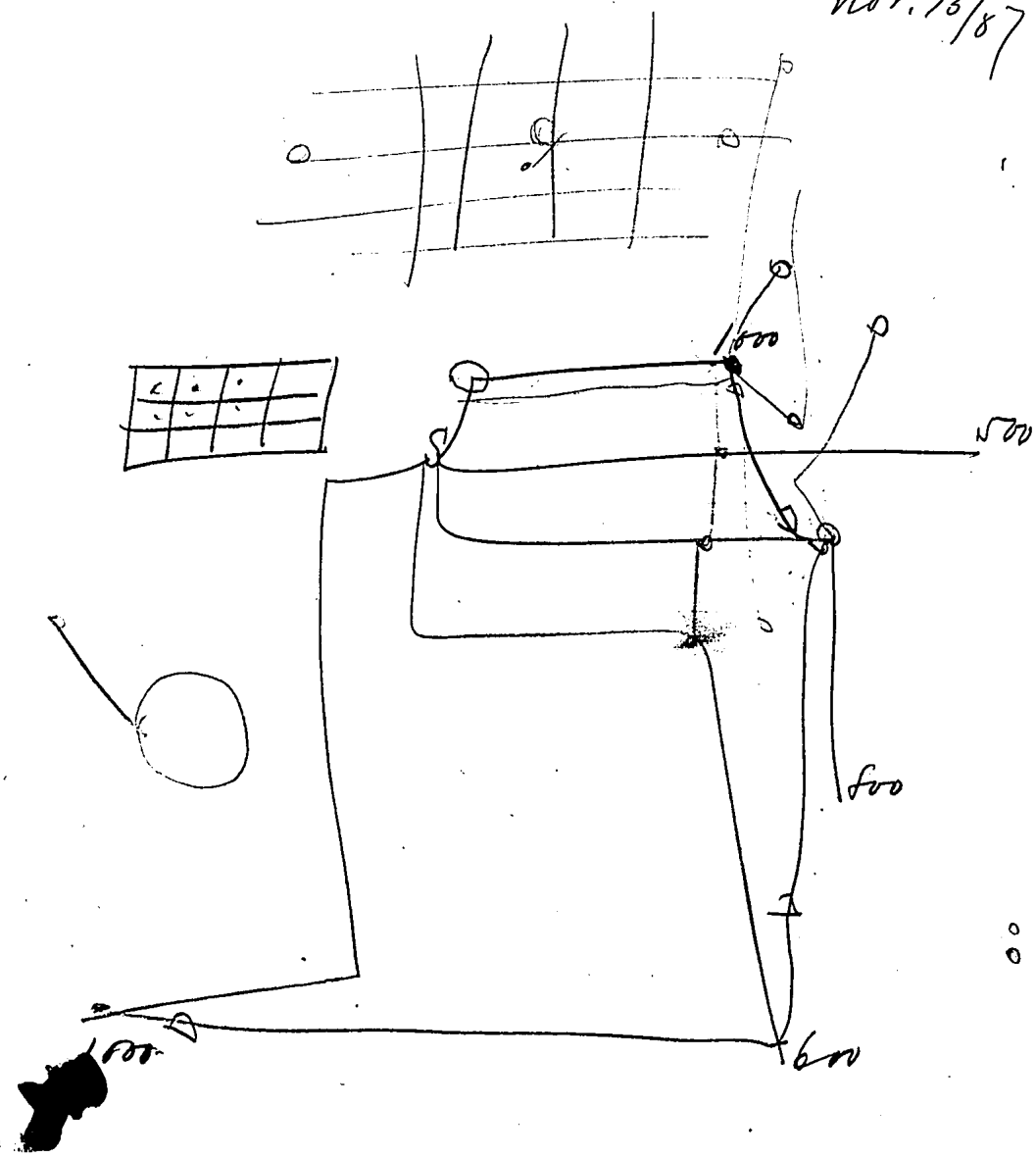
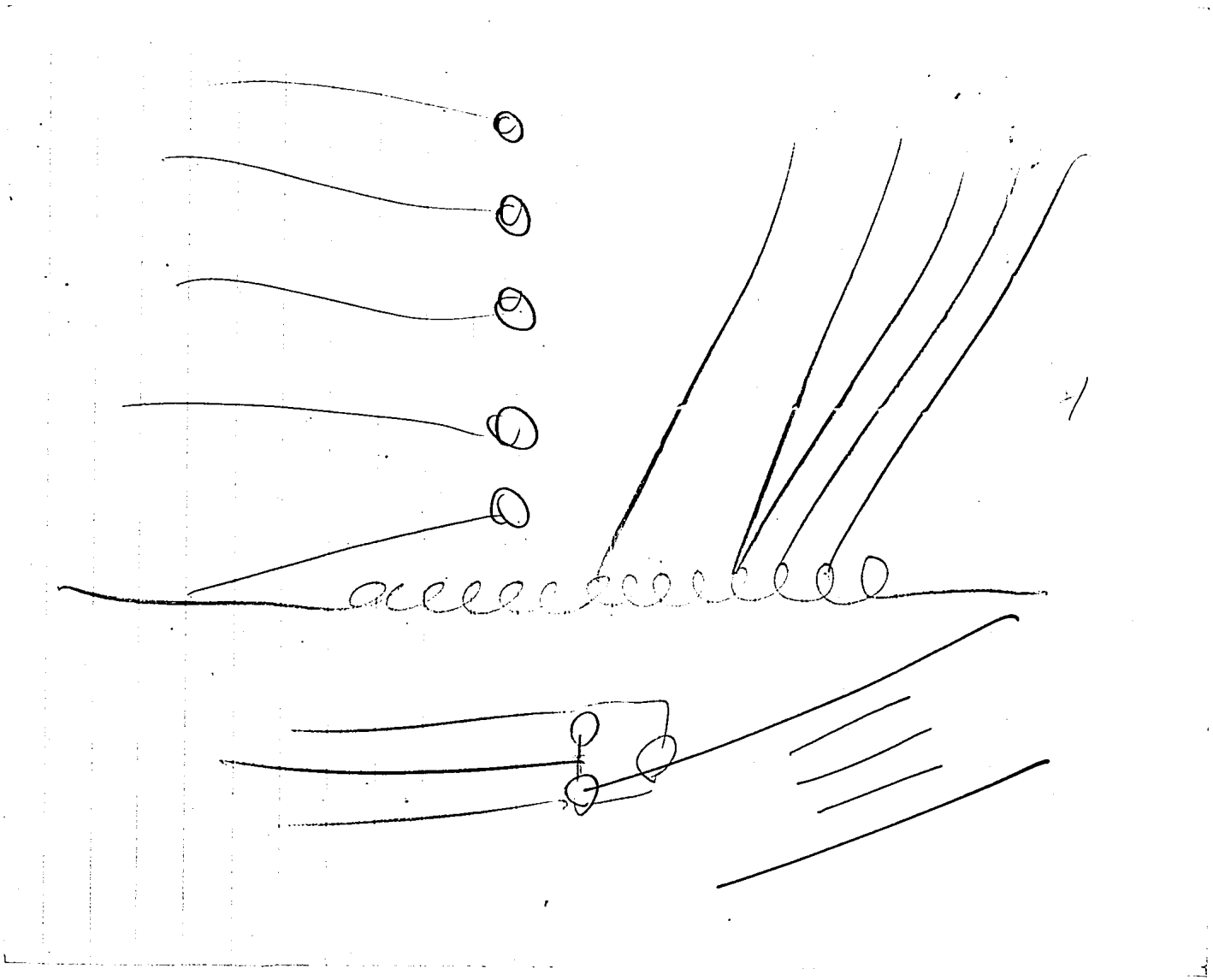


Thomas Edison
Nov. 15/87





Mina Edison
Nov. 15/87
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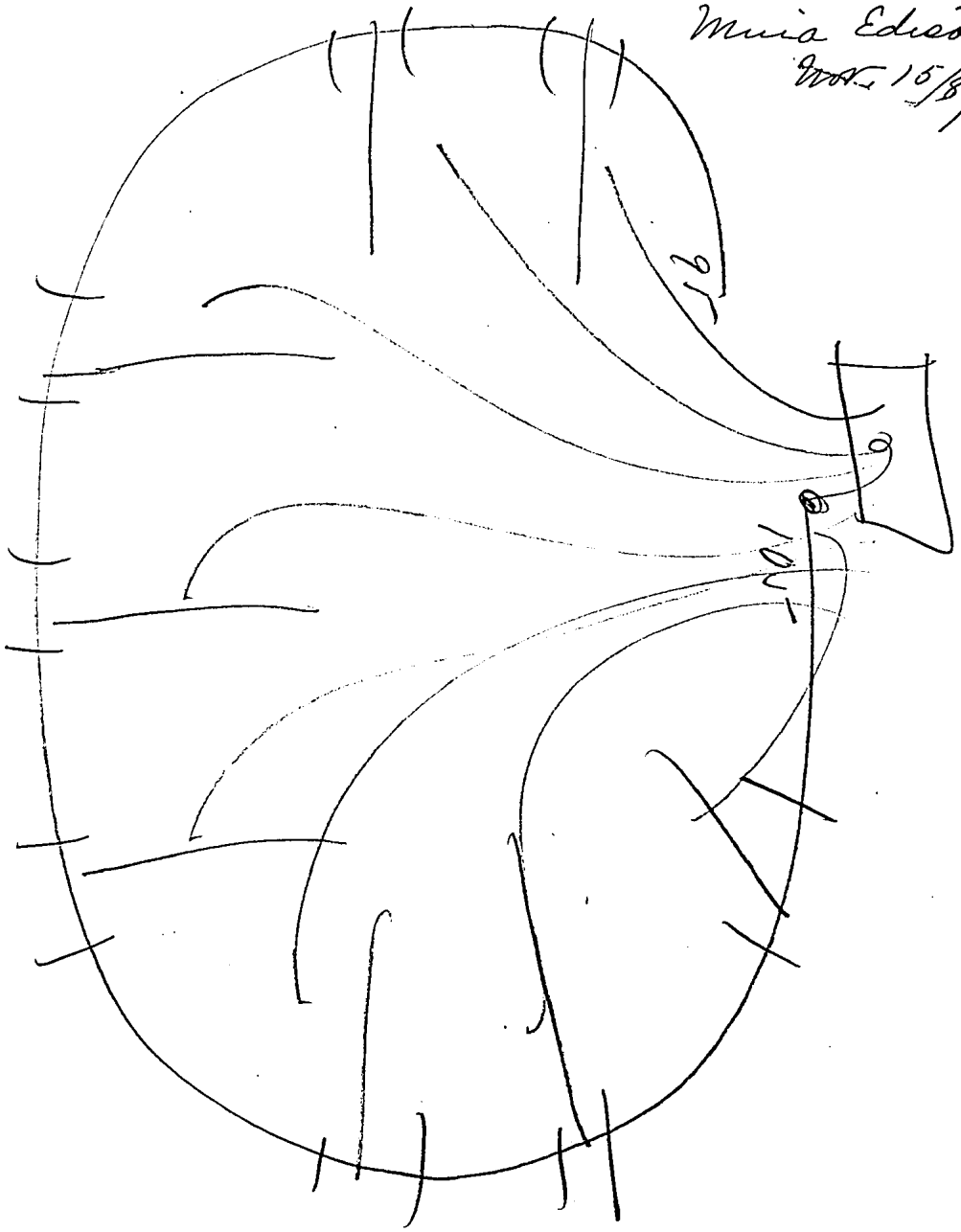
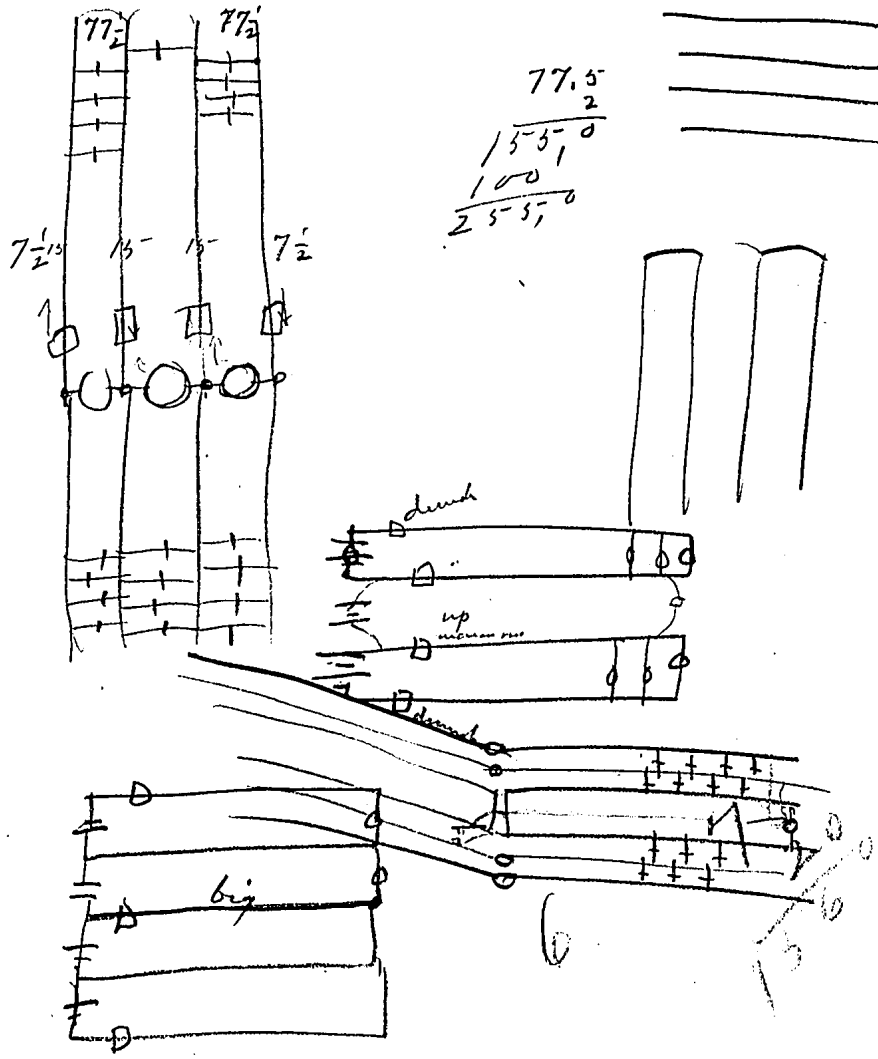
Maria Edison
Oct. 15/87



Cable Address "Edison, New York."

From the Laboratory of Thomas A. Edison.

Orange, N.J., _____ 1887.



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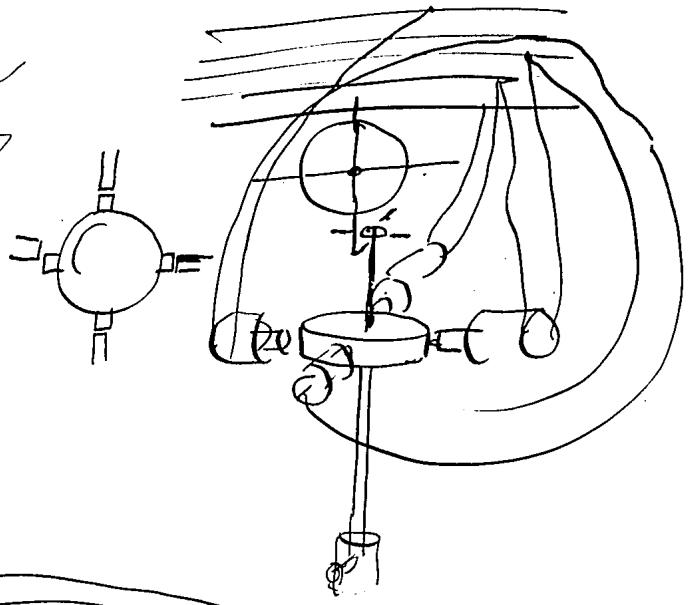
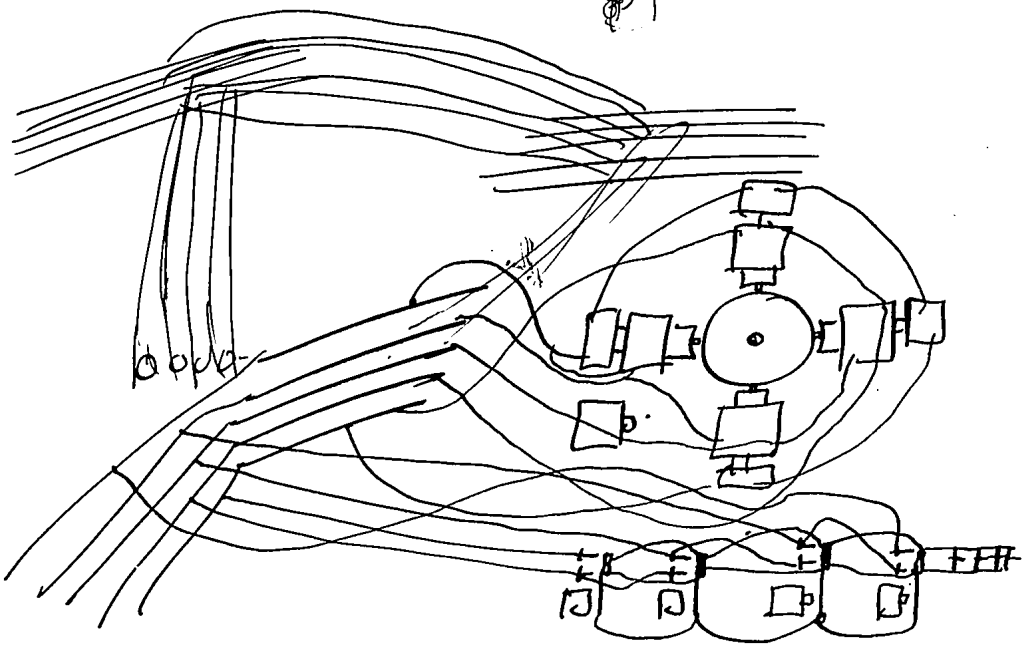
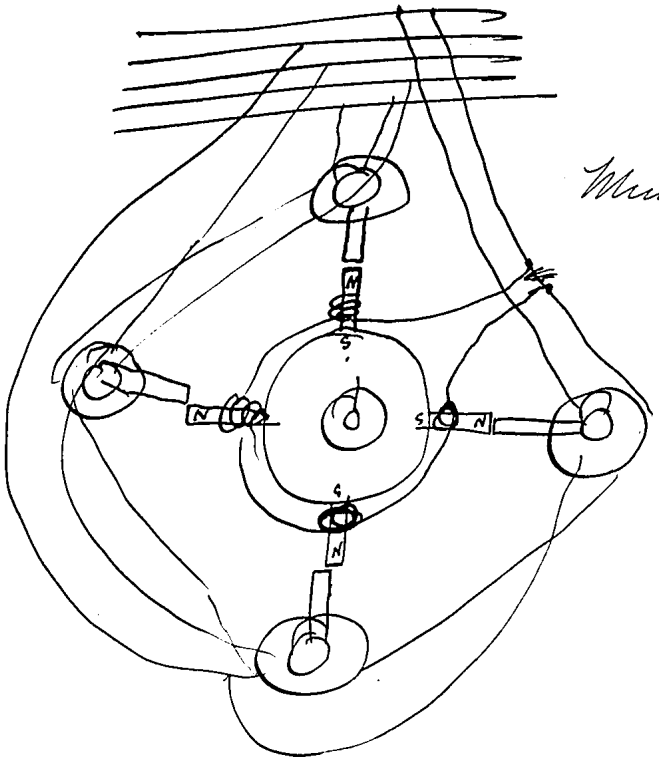
Nov. 29/87







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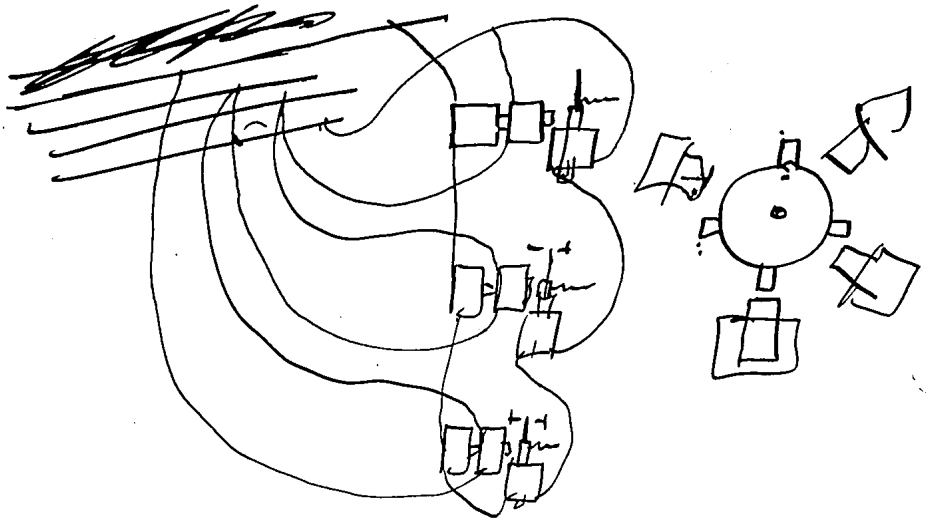
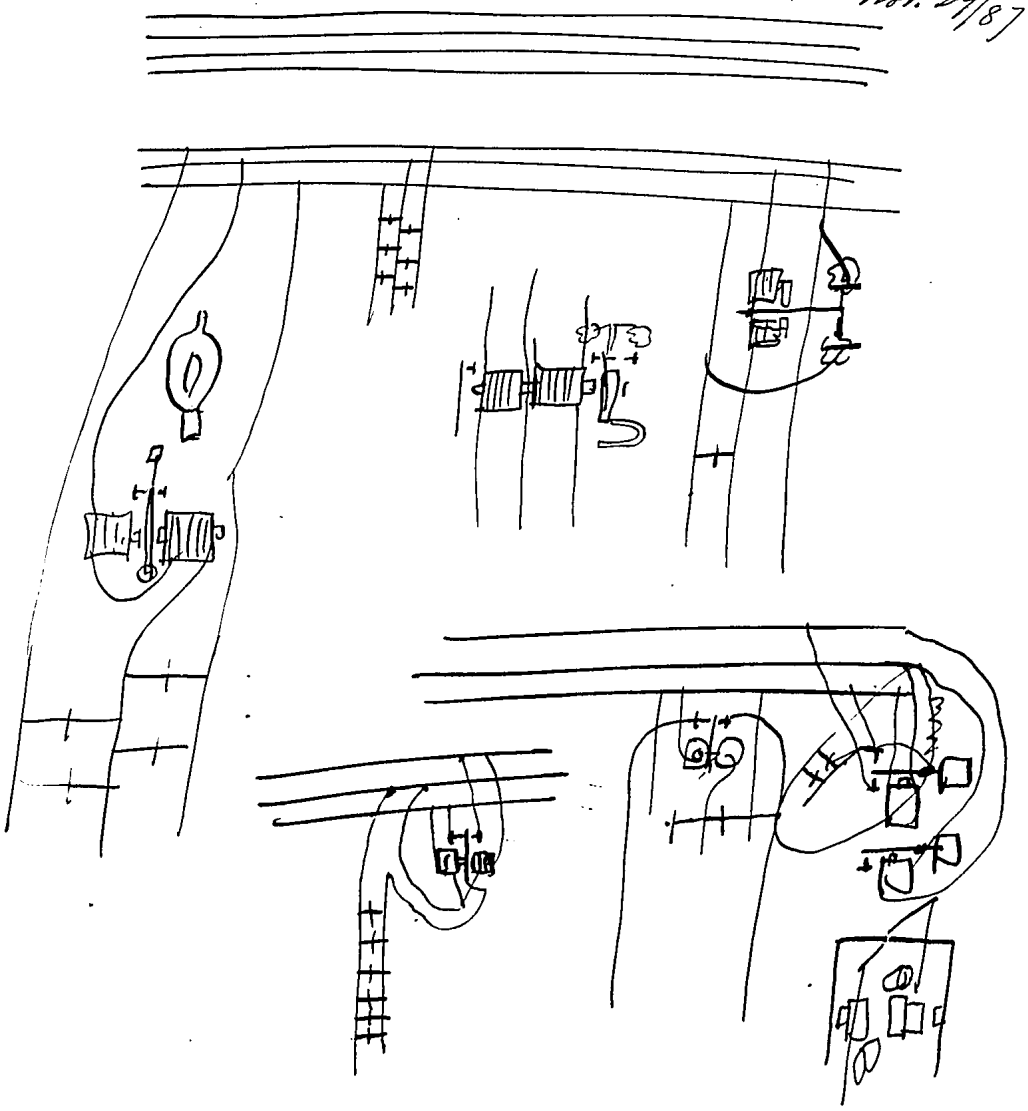
Maria Edison
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